California. Dept. of Fish and Game.
Biennial Report 1910-1912.
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BIENNIAL REPORT
OF THE
FISH AND GAME COMMISSION
1910-1912

STATE OF CALIFORNIA

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STATE OF CALIFORNIA

FISH AND GAME COMMISSION

TWENTY-SECOND BIENNIAL REPORT

For the Years 1910-1912

FRIEND WM. RICHARDSON, SUPERINTENDENT OF STATE PRINTING
SACRAMENTO, CALIFORNIA
1913

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LETTER OF TRANSMITTAL.

San Francisco, Cal., December 31, 1912.

Hon. Hiram W. Johnson, Governor,

State of California, Sacramento, Cal.

Sir: In accordance with law, we submit for your consideration a statement of the transactions and disbursements of the Board for the biennial term July 1, 1910, to June 30, 1912.

We are also including certain data concerning the transactions of the Board between July 1, 1912, and the date of this report, believing that the value of such data has justified holding the report for it. Certain technical reports which have hitherto been included in the Board's report are this year being issued in separate bulletins.

Respectfully,

F. M. NEWBERT, *President,*
M. J. CONNELL,
CARL WESTERFELD,
Board of Fish and Game Commissioners.

CALIFORNIA FISH AND GAME COMMISSION.

Commissioners, 1910-11.

M. J. Connell ..... Los Angeles
W. G. Henshaw ..... San Francisco
F. W. Van Sicklen ..... Alameda
Lendal M. Gray ..... San Francisco
Dr. David Starr Jordan ..... Palo Alto
Geo. V. Steed ..... San Francisco
F. G. Sanborn ..... San Francisco
Chas. A. Vogelsang ..... San Francisco
Chief Deputy, 1910.
John P. Babcock ..... San Francisco
Chief Deputy, 1910–11.
Hartley F. Peart ..... San Francisco
Attorney, 1910–11.

Commissioners, 1911-12.

M. J. Connell ..... Los Angeles
F. M. Newbert ..... Sacramento
Carl Westerfeld ..... San Francisco
Ernest Schaeffle ..... San Francisco
Secretary, 1911–12.
W. H. Shebley ..... Sisson
Superintendent of Hatcheries, 1911–12.
R. D. Duke ..... San Francisco
Attorney, 1911–12.

PART I. GENERAL.

TWENTY-SECOND BIENNIAL REPORT OF THE BOARD OF FISH AND GAME COMMISSIONERS.

PERSONNEL AND ORGANIZATION.

Since July 1, 1910, the personnel of the Board has been as follows: M. J. Connell, W. G. Henshaw and F. W. Van Sicklen served until November 3, 1910, when Lendal M. Gray was seated as a member, succeeding F. W. Van Sicklen, resigned. On November 4, 1910, Dr. David Starr Jordan was seated as a member, to succeed W. G. Henshaw. Upon the death of Commissioner Gray in December of 1910, Geo. V. Steed was appointed to serve, but was never seated as a member of the Board. F. G. Sanborn was seated as a member on January 21, 1911, to succeed Mr. Steed. On August 4, 1911, F. M. Newbert was seated as a member of the Board, to succeed Dr. David Starr Jordan, resigned. Carl Westerfeld presented his credentials on January 2, 1912, and was thereupon seated as a member, to succeed F. G. Sanborn.

On August 11, 1910, John P. Babcock assumed the position of Chief Deputy, succeeding Chas. A. Vogelsang, who had been the Board's executive officer since October 12, 1901.

On November 29, 1911, the Board by resolution, abolished the position and title of Chief Deputy, and appointed Ernest Schaeffle as Secretary, to succeed Mr. Babcock, whose resignation had been tendered and accepted that day.

On the same day the position of Superintendent of Hatcheries was created, and W. H. Shebley, Superintendent of Sisson hatchery since 1893, was promoted to the place. Mr. Shebley has remained in charge of Sisson hatchery, being assisted in the management by R. W. Requa, assistant superintendent, and has in addition directed the Board's work in the field of fish culture and distribution. During the past nine months Mr. Shebley and his assistants have also made surveys of practically every dam and other stream obstruction, and of many of the ditches and canals in the State and have had charge of the construction of fishways and screens.

Hartley F. Peart, who had acted as the Board's attorney for over five years, presented his resignation on February 6, 1912. Mr. Peart's resignation was accepted and R. D. Duke of San Francisco appointed his successor.

Since the filing of the Board's last report, it has been deemed expedient to form a new administrative district, in addition to the San Francisco, Los Angeles and Fresno districts, already existing. The new district is in charge of Commissioner Newbert, with an office in

the Forum building in Sacramento. District management adds to the cost of administration but, in the Board's opinion, greatly increases efficiency. It will probably be found necessary within the next two years to further divide the northern part of the State.

PROPERTIES.

At the request of the State Controller an inventory of the State's property in the care of the Board was taken on June 30th of the present year. A skeleton inventory that will be found elsewhere in this report shows the total value of property under appropriate headings.

PEACE OFFICERS.

It should be plainly stated at this time that the enforcement of the fish and game laws of the State has been left almost entirely to the Board, except in those communities and counties so fortunate as to possess public officers alive to their responsibilities and to the value of assisting in the saving of one of the State's most important assets. The Board has received and appreciated the endorsement and support of many police, prosecuting, and judicial officers in the State and expresses this criticism with the greatest regret and the knowledge that it will cause some ill feeling and friction. The property of the people is at stake, however, and we feel that we would be recreant to the trust imposed upon us if we did not call attention to what we have learned to be a real evil.

Many fish and game officials object to any coöperation between game wardens and peace officers, arguing that no one but a specialist is competent to act in work that is so peculiarly a specialty as fish and game wardenship. The argument does not seem a sound and sufficient one, although we must grant that the best work to be done by game wardens can only be done by officers specially and thoroughly trained in the ways of fish and game, and of fishermen and hunters.

FOREST SERVICE CO-OPERATION.

The Board wishes to speak of the splendid assistance it has received from the United States Forest Service, under the direction of District Forester Coert Du Bois, ably assisted by the supervisors of the nineteen national forests (or forest reserves) in the State. Upon the recommendation of Mr. Du Bois and the supervisors, the Board has deputized over three hundred forest officers, or "rangers," and knows that splendid work has been accomplished by them.

An effective coöperation between the two departments is made possible only by a system of direct supervision, by chief forest deputies on each forest, devised by Mr. Du Bois. Through it the Board is relieved of the necessity of issuing instructions to and receiving reports from over three hundred active men, who undoubtedly are more efficiently and satisfactorily directed by their own chiefs. Each chief forest deputy files a special report with the head office of the Board on the first day of January and on the first day of July of each year, in addition to keeping up a more or less regular correspondence.

By a ruling of the Forest Service, none of its officers can receive compensation for assisting in the enforcement of state laws; it has been possible, however, for the Board to pay the expenses necessarily incurred by forest officers in the prosecution of fish and game cases.

SALARIED, OR REGULAR DEPUTIES.

The Board has a force of deputies (patrolmen or game wardens) distributed over the State at the present time, apportioned to districts as follows: San Francisco, 24; Sacramento, 29; Los Angeles, 11; Fresno, 9.

This force has been built up very largely since 1907, when the revenues of the Board were increased through the first receipts from hunting license sales, and in the opinion of the Board constitutes a very effective and creditable body of officers. The splendid police record made by these men, as shown in the statements of seizures and prosecutions, published in this and in previous reports, is the highest praise that need be offered them.

The state "game wardens" of California are probably the best paid wardens in the world, and the Board believes that every man on the roll is worth what he receives, if not more. Cheap men could be obtained, of course, but men who can do the work needed in this State are not cheap men, and are available for the state's service only as they are assured of proper compensation.

The deputies, or "wardens" in each administrative district, report to the Commissioner or deputy in charge of the district and perform their duties as directed by him. The head office has only the most general supervision of the work within the outside districts and is seldom required to act in even an advisory capacity.

"OUTSIDE," OR SPECIAL DEPUTIES.

The special deputies assisting in the Board's work now number about 400 men, exclusive of forest officers. Many of these deputies have records that compare favorably with those of the most efficient regular officers, while the force as a whole serves as a very valuable and thoroughly appreciated auxiliary. Even if little police work were done by this body of irregular officers, it would still serve as a training school from which to recruit regular deputies.

Every effort is made to keep undesirable candidates out of this force and to weed out with the least possible delay all those who prove unfitted from any cause.

The special deputies receive no salaries, but are paid for their services in prosecutions and are sometimes allowed expenses.

PROGRAM AND WORK.

We recognize that we are administering a public trust, that to us has been assigned the duty of protecting and conserving the fish and game interests of the State for the benefit of all the people, and that to be successful we must have their active coöperation. We believe we can gain their confidence and support by keeping the people fully informed of the nature and scope of our work. We shall attempt to

do this by issuing letters and bulletins from time to time, as well as by complying with that provision of the law which specifically requires this Board to biennially submit to the Governor a full report.

We aim to work on broad, practical and economical lines, and to make the Commission something more than a police force. We shall endeavor to enforce the laws for the preservation of fish and game, and to stock the public waters of the State with food and game fishes best suited to them. By economic and scientific investigations we hope to disclose the life, habits, and abundance of our fish and game, and the conditions most favorable to conserve and, if possible, increase the supply.

We shall maintain a State Game Farm, and shall use every effort to propagate our native species of game, and in particular, the valley quail, recognized as one of the finest game birds in the world—and certainly the game bird best suited to the uplands of this State.

We shall continue to operate the fish hatcheries to their full capacity, and to distribute the output in suitable public waters in every section of the State. We will not stock private waters. We shall give to the distribution of the fish produced in the fish hatcheries the greatest care, endeavoring not only to see that the young fish are intelligently liberated where they may best thrive, but by close observation to ascertain the success of such methods, and to ascertain further if additional and more effective measures can be found.

It has already been demonstrated that the operations of the hatcheries and the stocking of streams in the State with native and non-indigenous fish have produced great results. No other state has reaped as great reward from the moneys so expended.

We believe that, notwithstanding the notable success that has already followed the introduction and the acclimatization of new food and game fishes in the waters of this State, as well as the propagation of our native fishes, much can yet be accomplished; that our waters may be made to produce even more abundantly; for, notwithstanding that this Commission has been in existence for forty years and has accomplished greater results than any similar commission in the United States, very little attention has been directed to a study of the life and habits of any of our food fishes. To intelligently conserve and increase our aquatic food supply it is essential to be conversant with the life, habits, food, abundance and the principal enemies. Until we know the time and place where our food fishes propagate, the waters frequented by their young, and the conditions essential for successful development, we can not proceed intelligently. And, we regret to say that until recently, the Commission was not in possession of sufficient positive information of this character. To obtain such knowledge, we have during the past eighteen months begun a systematic and scientific investigation of the life of our most important food and game species. For this work we have been enabled to enlist the services of several well known scientific men.

The study of the life, abundance and the conditions most favorable to the maintenance of our edible crab (*Cancer magister*) was begun under the auspices of the Board in October of 1910. The work is in the hands of F. W. Weymouth of Stanford University, who is a recognized authority. At the time this investigation was instituted little was known as to where or when these crabs propagate, or the life of their young.

Professor Harold Heath of Stanford University, at our direction, began in December of 1910 a research intended to disclose the life and range of our edible clams. Very little or nothing is known of the life of these valuable mollusks. There appears, however, to be only a limited area in this State which affords opportunity for their existence, and in consequence, we believe that there is great danger that, with the increasing demand and the present unrestricted methods of digging them, the clam beds of the State may be speedily exhausted. We hope, through the efforts and studies of Professor Heath and his assistants, to be able to lay sufficient facts before the legislature to warrant the adoption of measures that will insure the future supply.

The spiny lobster, or "crawfish" fishery of the southern coast is a very important one, but like the other fisheries has been greatly reduced by the heavy operations of recent years. To obtain the accurate information necessary to any scheme of rehabilitation, Professor Bennet M. Allen of the University of Wisconsin, was engaged in July of 1911 to make a study of this animal. Professor Allen's work has been interrupted by the necessity of returning to his university for teaching, but it is hoped that a continuance of his investigation may lay bare many secrets now hidden.

In August of 1911 Dr. Chas. L. Edwards of the University of Southern California undertook a study of our abalones. Dr. Edward's preliminary report, which will be found in the Board's 1913 Fish Bulletin No. 1, is a very complete exposition of the need and value of his particular investigation.

In addition to the investigation that we have begun into the life history of our principal food and game fishes, we have also instituted an investigation of the relations of certain birds to the agricultural interests of the State. Harold C. Bryant, of the State University at Berkeley, has been engaged to conduct the inquiry. We hope to show in what manner each doubtful species of bird affects the farmer and the fruit grower, and what measures are to be taken to encourage the beneficial birds and to exterminate the injurious ones.

Believing that great good will come from the proper education of our children as to the value of the wild birds and animals to the farming interests of the State, and not alone to the sportsmen and the lovers of nature, we have engaged the services of Gretchen L. Libby, late secretary and lecturer for the Audubon Society of California, to conduct a campaign throughout the public schools of the State.

In March of the present year, it was suggested to the Board by Dr. C. A. Kofoid, Professor of Zoology of the University of California, that there was urgent need of a scientific study of the deer and other large game animals of the State. Dr. Kofoid stated that the study had been recommended to him by Dr. Palmer of the U. S. Biological Survey, as the basis for advanced conservation measures, without which our large game could not be preserved. Acting upon the recommendation of Dr. Kofoid and Dr. Palmer, Frank C. Clarke, a post-graduate student of the University of California was employed to conduct the investigation mentioned. Mr. Clarke has traveled over much of the State during the past four months, obtaining information as to distribution, numbers, breeding seasons, etc., that we consider of much value. A preliminary paper will be found in the Board's 1913 Game Bulletin No. 1.

N. B. Scofield, a fishery expert who has been in the employ of the Board at periods for a number of years, has made scientific studies of the shrimp and salmon during the past two years. Mr. Scofield has also assisted in stream surveys along the coast, and has made as thorough a study as his time has permitted of the operations of the trawl fishermen working outside the Golden Gate, and of the lampara net fishermen of Monterey Bay. Several of Mr. Scofield's reports appear in the Board's 1913 Fish Bulletin No. 1.

A very large and important part of the Board's work in the last ten years has been the regulation of various industries in order to prevent or minimize the pollution of the State's waters. While the results obtained are not yet fully satisfactory, we believe that the Board's work deserves public approval.

Outside of cities with their sewage, the principal sources of stream pollution at present are quartz mills and oil refineries, oil loading stations and oil carriers. All of these sources are now in the way of proper handling, after the expenditure of much effort and money.

As will be shown by this and by reports filed previously, the Board has instituted a considerable number of prosecutions for the pollution of State waters. By far the greater work, however, has been done in obtaining a compliance with the statutes through less expensive and tedious means. It is impossible to obtain even an estimate, but we believe that $250,000 has been spent at the Board's direction in the past two years in constructing oil traps and settling basins, proper hose and pipe connections, acid recovery plants, lampblack and oil-tar separators and filters, sawdust burners, and other contrivances and systems having as their sole purpose the safeguarding of public waters and the protection of the aquatic life therein.

WHAT THE COMMISSION HAS DONE IN TWO YEARS.

Has taken its place in the front rank of state fish and game commissions by instituting and prosecuting scientific investigations of game

and fish, in almost every case with the coöperation or under the direction of the State's leading universities.

Has placed the work of fish culture and distribution on a proper foundation by creating the position of Superintendent of Hatcheries, by appointing a highly qualified expert to the place, and by then allowing him to manage the department.

Has made the greatest and best distribution of trout (over 26,000,000) ever made in the State.

Has provided a department of game conservation, under the direction of a competent expert, which in time will be as important as the fish cultural department.

Has economically managed the State Game Farm, and distributed more pheasants during the season of 1912 than were distributed during three previous years.

Has increased the force of wardens by over twenty men, providing an effective patrol for every part of the State, and particularly the northern part.

Has increased the efficiency of the wardens by detailing special deputies, the Board's attorney and others, to instruct them as to their duties and the subjects with which they have to deal.

Has greatly increased the efficiency of the service in the northern part of the State by forming the Sacramento district from a district that comprised almost fifty per cent of the total area of the State, and by leaving the direction of business in this district to the President of the Board.

Has fairly but firmly enforced all the fish and game laws in every part of the State, prosecuting 2,063 cases, against 1,771 for the best previous two-year period. (The record for the past two years would be much greater were it not for the fact, in the Board's opinion, that violations are becoming less and less common.)

Has aroused public interest in fish and game conservation by directing and otherwise aiding in the formation of a great and representative protective organization, with a membership of over 16,000 people, scattered through every county in the State.

Has made surveys of almost every stream and lake and other body of water in the State, disclosing the fact that hundreds of square miles of water have passed out of control of the public, and that hundreds of square miles are still entirely barren or have no valuable fish.

Has made a comprehensive survey of the natural and artificial waterways of the State, following this by directing the construction of hundreds of screens and fishways.

Has watched the disposition of factory and other waste products, instituting prosecutions and otherwise striving to abate known causes of damage.

Has removed rocks, timber blockades and other obstructions in a number of streams in northern California.

Has transplanted hundreds of thousands of trout, black bass and

striped bass from overflow waters along the coast and in the interior valley.

Has been one of the first commissions in the country to provide its patrolmen with motorcycles, thus reducing transportation expenses and greatly increasing efficiency of force.

Has perfected a coöperation of effort with the U. S. Forest Service, whereby the State secures without cost the services of over 400 highly trained officers, almost all of whom are located in the best fish and game regions.

Has from the head office alone written or issued about 25,000 individual letters, 50,000 copies of circular letters, 325,000 abstracts, or synopses of the fish and game laws, 12,500 game law posters, 8,000 copies of the Board's compilation of the fish and game laws, thousands of copies of the several bulletins and reports already issued, and a great deal of other matter. (About 300 newspapers and periodicals in the State are on the Board's mailing list; to them all is sent each month a statement of the lion bounties paid for the previous month, another statement of the searches, seizures and arrests made by the different districts, and a statement of the Board's expenditures for the month past. If any of these statements are omitted for a month or more, a statement covering the elapsed time is issued.)

Has made studies of general fish and game conditions, and of fishing methods and apparatus, through the Superintendent of Hatcheries, the Assistant in Charge of Game Conservation, and other scientific assistants, and by deputies.

Has made a systematic study of the climatic and other conditions that determine the distribution of plant and animal life, with the idea of preventing the loss of effort, time and money that has occurred in the past through experiments in game introduction and transplantation that were not based on knowledge of vital facts.

RECOMMENDATIONS.

It will be noted that the Board offers no recommendations as to changes in existing legislation or the provision of new. The following quotation from a letter issued by the Board during the fall of 1911 sets forth fully the attitude of the present Commission and explains its deviation from an old practice:

> "It has often been said that the fish and game laws of the State of California were passed in the interest of a favored few, to the prejudice of the great mass of the citizens of our State.
>
> Such impression has gone forth, doubtless, by reason of the fact that the people generally have had but little, if any, voice in suggesting or proposing legislation upon the subject, resulting in lack of co-operation by the people with the Commission, without which co-operation neither beneficial laws can be passed, nor material progress be made.
>
> The Commission sincerly desires the active, hearty and earnest

co-operation of all the people of this State in the great work which is before it.

This Commission will be for the people, and it wants their expression as to the laws most suitable for their districts. In other words, it wants the people of the great State of California to say to the Commission, 'We want this and we want that,' and not for the Commission to say, 'We will give you this and we will give you that.' ''

Such recommendations as may be found in this report are to be considered as representing the personal views of the specialists submitting them. The Board does not *necessarily* endorse any of them.

ACKNOWLEDGMENTS.

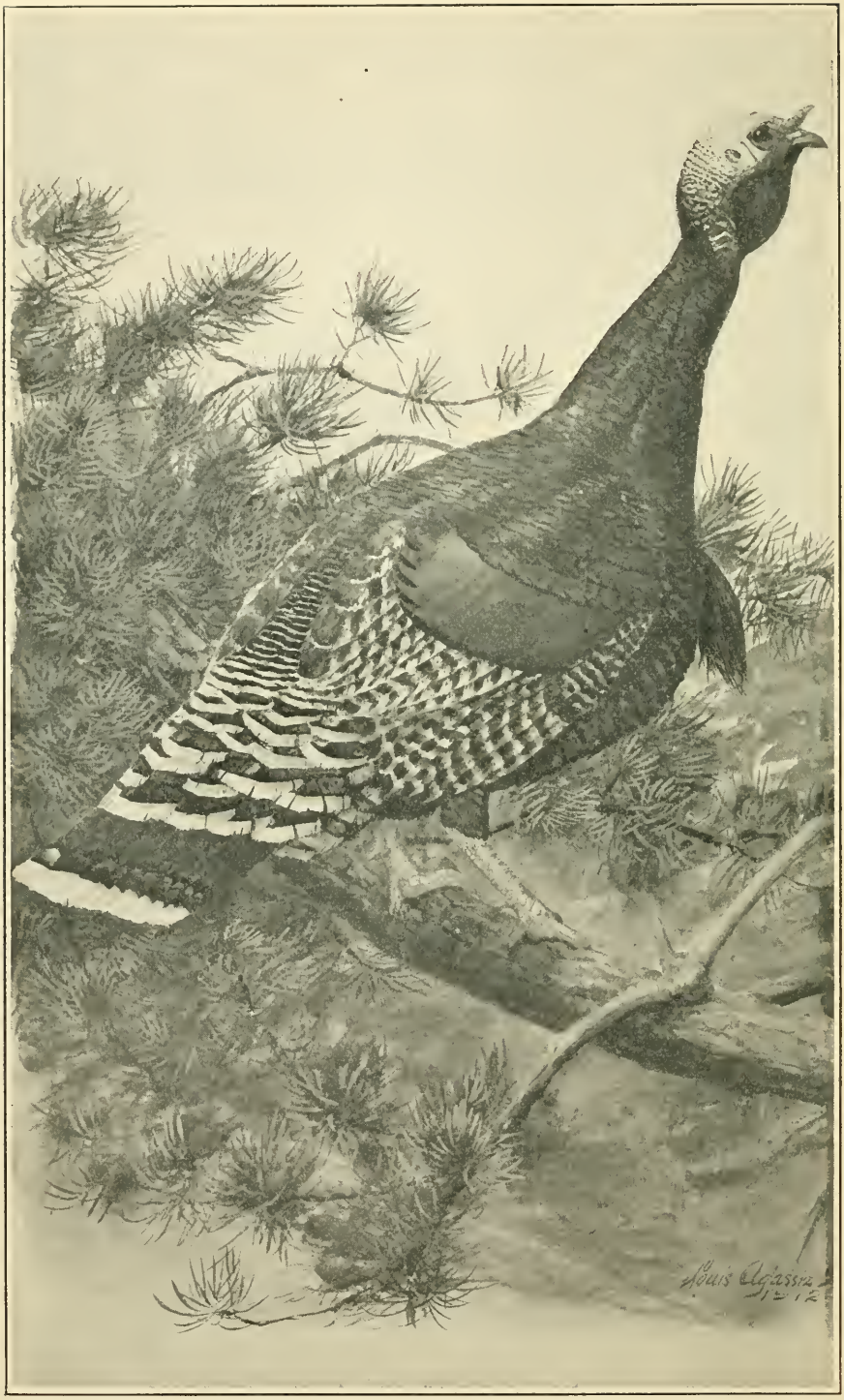
The Board desires to express its sense of deep obligation to the State commissions and departments, and to the universities, scientific institutions and individual scientists in the State and country, whose hearty support during the past two years has made possible the prosecution of many technical investigations. Particularly is the Board indebted to the University of California, the University of Southern California and to Leland Stanford Junior University, for not only support, but for active effort and the direction of difficult studies.

We wish also to thank, personally and officially, the many railroad and other transportation officials in the State, through whose unfailing courtesy the transportation of fish and attendants and special employees, has been possible. Without the free and reduced rate transportation of fish and fish eggs and game, that has been provided by the Southern Pacific, the Western Pacific, the Sierra, the Northwestern Pacific, the Lake Tahoe Railway and Transportation, the Nevada-California and Oregon and other railway companies and by the Pacific Coast Steamship Company and the Wells Fargo and Globe Express Companies, the distribution made by the Board would have been but a part of the gratifying total reported.

In concluding this report we desire to state that during the year that has just past every possible encouragement and assistance has been given by the public. Any success that may have crowned our undertakings must be credited to this favorable and growing sentiment.

Respectfully submitted.

F. M. NEWBERT, President,
M. J. CONNELL,
CARL WESTERFELD,
Board of Fish and Game Commissioners.



Mexican Wild Turkey (*Meleagris gallopavo*).

GAME CONDITIONS IN CALIFORNIA.

By J. S. Hunter,

In charge Game Conservation, Fish and Game Commission.

As a people we have been slow to realize the importance of the wild life of our country. Our love of hunting has caused the extermination of some our characteristic varieties of game. In our desire to have a full game bag to our credit, we have been reaching out to the more inaccessible places where game still approaches the conditions that were formerly common throughout the entire country. This desire to protect and cherish that with which we were so abundantly favored has not kept pace with the ability to kill; so that at the present time, there is in many of the states practically no game.

In our own State, while there is not an abundance of game, enough will still remain if judgment is used in the killing that the generations to come will find a state in which game still flourishes and in which the man who enjoys the most fascinating of all sports, may go into the field with his gun and dog and participate in the pleasure of his forefathers.

Our game animals are so valuable that the title to them has been retained by the State. Of late years, the right to take this game has been refused until a hunting license was secured. The law compelling a license has been one of the most popular that has ever been enacted, not only in California, but in every state in which it has been adopted. Millions of dollars are invested in our State in guns and other hunting paraphernalia. This sum has been variously estimated as reaching into nine figures. It is perhaps safe to say that it is not less than twenty-five million dollars. Add to this sum the amount that the score of clubs throughout the State have invested in land and buildings and it will probably total over one hundred million dollars. There are sold in California alone every year twenty-eight million shotgun shells. Every industry benefits from the fact that there is game in our State. Railroads run special hunters' trains during the open seasons. The opening of the season is made the feature of window displays throughout the State. Hotels and resorts, even small towns, owe their very existence to the fact that they are established in a game country. To a great extent, the sturdiness of the American people can be attributed to their love for hunting and outdoor amusements. A state in which game flourishes attracts people from all over the world. The value of land is increased by there being game upon it.

There are present in California so many different conditions of climate and topography that it is almost impossible to create a blanket fish and game law. When deer, for example, are in proper condition to be killed in one section, they are out of condition in another. Two

years ago the legislature divided the State into game districts. Those selected were based upon artificial boundary lines without sufficient regard to natural conditions. In order to be satisfactory, districts must be based upon faunal, geographic and climatic conditions. In another part of this report will be found a suggestive districting scheme, which we believe will be far more satisfactory.

The present condition of game in the State is far from satisfactory. It is possible to secure the bag limit of any variety of game in any part of the State only with a great deal of difficulty. This is not necessarily due to the lack of enforcement of our present game laws, but to the fact that the seasons are too long, not rightly placed, that the number of hunters has been increasing year by year, and to numerous other causes.

DEER.

It is reported in many parts of the State that deer are on the increase. In view of the greater number of hunters, this is remarkable if it is correct; but it is doubtful whether careful investigation will uphold the current reports. There are probably killed in the State each year by hunters, 10,000 deer. Records were secured in 1911 of nearly 7,000, and it is safe to assume that at least 3,000 more were killed. It has been estimated that every mountain lion will kill at least 52 deer a year. Place the lion population at 250 and we can charge up 13,000 deer to lions. Coyotes and other varmints will without doubt bring the total number of deer killed up to the neighborhood of 30,000. In average years the natural death rate is not great; most of them meet violent deaths, so that 30,000 can be fairly accurately placed as the number of deer dead from all causes in the State.

ELK AND ANTELOPE.

Of the thousands of elk and antelope that formerly ranged in our State, we now have but a few scattered bands, feeble reminders to fill us with remorse for the protection we did not give such magnificent game. In the San Joaquin Valley near Button Willow and in the Sequoia National Park range are all that are left of the thousands of "tule" elk that formerly were found throughout the San Joaquin and Sacramento valleys. This species is peculiar to California. They now number between 400 and 500 head. It is reported that twenty odd years ago the band had decreased to less than twenty head. Since that time they have been given protection by the Miller & Lux Company and have now increased to their present number. On account of the size of this herd, it will soon be necessary for the State to take care of them, as no private interest can stand the expense of so great a number of large animals ranging at will through fences and over fields. The writer and Professor Grinnell of the University of California during the past summer visited this section of the State, and a plan

was formulated which it is believed would result in properly caring for the "tule" elk. It is hoped that something along the lines suggested by Professor Grinnel in the following report, can be adopted:

BERKELEY, CALIFORNIA, June 13, 1912.

State Fish and Game Commission,
San Francisco, California.

GENTLEMEN: I submit herewith a statement in regard to the dwarf elk (*Cervus nannodes*), as it occurs at the present time in the San Joaquin basin. This information was obtain largely by Mr. J. S. Hunter and myself during the last ten days in April, 1912. During this period we explored the district west from Bakersfield, in Kern and San Luis Obispo counties.

According to the consensus of the accounts given us by old residents of the region, elk formerly ranged in considerable numbers throughout the Sacramento and San Joaquin basins, south to the immediate environs of Bakersfield, thence west through the inner coast ranges and intervening valleys as far as the plains of the Cuyama Valley, in San Luis Obispo County, and extreme northern Santa Barbara County. Before they had become much reduced in numbers, in the sixties, elk occupied most of the tule swamp region of the bed of the San Joaquin Valley. On this account this species of elk has been frequently called the "Tule" elk. The animal, however, ranged up into, and through, the barren ranges of hills all along the west side from west of Tulare Lake south to the vicinity of Maricopa.

By the year 1874 the elk had disappeared throughout nearly all of this territory. One report has it, that in 1874 but one single pair of elk remained between Tulare and Buena Vista lakes. These were on the property of Henry Miller. This gentleman decided to save this remnant if possible, and offered large rewards for information leading to the identity of any one molesting the animals. It is said that the fine herd of elk now existing, has descended from *this pair of animals preserved by Mr. Miller.*

The cause of the rapid decrease in the original numbers of elk is said to have been due to hunters, who make it a business to "jerk" elk meat, and sell it to prospectors on the desert.

It would appear that the dwarf elk never ranged outside of the lower Sonoran life zone within the San Joaquin-Sacramento basin. There was, however, a slight seasonal shifting. To this day, the does go up into the hills during the season when the fawns are born. At this time, too, bands of bucks range high into the hills, but not, generally, above the limits of the temperature conditions existing in the lower Sonoran zone.

The point I wish to bring out here is that this species of elk can not be expected to thrive if transported into any other faunal area than that in which it was originally native. There is no barrier to prevent the dwarf elk spreading high up into the pine belt of the Sierra, or even into the Mojave desert, or west into the coast district. But they did not go, finding the different climatic conditions prohibitive.

The rate of reproduction, that is, the rate of increase, of the dwarf elk is believed to amount to the doubling of the herd every four years, as long as conditions remain normally favorable. It is obviously, however, impossible for such a rate of increase to have been maintained since the original nucleus of the herd was first given protection. It is probable that there are good grounds for believing the numerous rumors, that there has been more or less poaching, even up to within a very few years.

Our investigations in April resulted in our belief that there are at the present time very close to 400 head of elk ranging from Buena Vista Lake to the vicinity of Button Willow and thence west into the elk hills; and as far as known, these are all of the representatives of the species in existence, save for a few which were removed in 1904 to the Sequoia National Park, and a very few in confinement elsewhere. The main herd remains a large part of the time on the valley lands belonging to Miller & Lux, and the Kern County Land Company.

There is no denying the fact that the presence of this great number of animals running at large, inflicts serious injury to these properties. We saw elk crowd *through* fences and trample fields of standing grain. I am informed upon good authority, that it is estimated that on the Miller & Lux property alone, $5,000 worth of damage is done each year by the elk, in breaking fences, and in trampling alfalfa and grain outside of what forage they actually consume.

The elk pay absolutely no attention to the ordinary cattle fence. We saw them go over both barbed-wire and rail fences with the greatest ease. The elk prefer, however, to crowd through if they can, as we observed in several cases.

The problem presenting itself for immediate action on the part of every one interested, is that of securing a permanent range. Everything points towards the rapid subdividing of the large land holdings into farms. No single owner can then stand the ravages of the elk. It is not for a moment to be supposed that any one advocates the unlimited protection of elk under the present conditions of rapid settlement of the California valleys. It is, however, consistent with the highest ideals of conservation that at least a representation of the animal be preserved in as nearly their native surroundings for all time. The steps leading to this consummation must be taken at once, while there is yet the opportunity of securing adequate areas of land in their native domain.

Nothing is more certain than that only failure can attend any attempt to move the elk from the limits of their native range. This was abundantly proven by the disastrous results of the "drive" of 1904 when the attempt was made to remove the entire herd to the Sequoia National Park.

The following suggestion has been made, as receiving favorable consideration by several persons qualified to judge, who are intimately interested in the problem: That three sections of land be acquired, one of these to be located in the bed of the valley between Buena Vista and Tulare lakes, the other two to lie to the westward, up into the elk hills. The first designated section should be of first class land (which is now valued in that vicinity at $100 an acre—$64,000 for the section). This section of arable land would have to be purchased or donated, but it is probable that the adjacent two sections of desert land could be secured under some sort of lease from the Federal Government.

The three square miles thus indicated would have to be completely fenced to keep the elk from doing depredations to the surrounding country. A special elk-proof fence would have to be constructed, and at a cost of $800 to $900 per mile. Such a fence would have to be at least seven feet high, and of such materials that elk could not break through. Of the arable section of land, at least 250 acres should be grown to alfalfa. This in connection with the native forage on the uplands would support about 500 elk.

It is suggested that further increase of elk could doubtless be disposed of from year to year for eating, or for stocking elsewhere. Such sale might establish the means of permanent support, to defray the salary of a man continually in charge, and the extra labor necessary in haying time.

The above brief outline for the establishment of a refuge for the dwarf elk I believe to be not only feasible but immediately necessary if we are to expect the preservation of this, one of the most interesting species of native game animal in California. It seems to me that the State Board of Fish and Game Commissioners could carry out the necessary details with much less difficulty than at the outset might be anticipated. Successful accomplishment would bring everlasting commendation for the far sightedness of this undertaking.

Respectfully submitted and recommended.

(Signed) J. GRINNELL,
Museum of Vertebrate Zoology,
University of California.

Besides the "tule" elk, another variety is found in very small numbers in the more humid parts of the State, in Humboldt and Del Norte counties. On account of the nature of the country, which is covered with timber and brush where this species range, it is difficult to accurately estimate their numbers. There are several small bands, numbering from six to twelve animals. It is safe to say that they do not total over 200 individuals. The people living in that part of the State are coöperating in ensuring these animals absolute protection, and it is to be hoped that they may be saved.

The antelope is more extensively distributed. A few are still found in the desert region bordering on the Colorado River in the extreme southeastern part of the State; some are also found in Antelope Valley,

in the northeastern part of Los Angeles County, while in western San Joaquin Valley the largest band of the State is found. These number upwards of 150 individuals. In Modoc, Lassen and Siskiyou counties there are several small bands. All told, there are probably about 600 antelope left in the State. The antelope does not take well to domestic conditions. They tame easily, but up to the present time, no success has been had in the breeding and raising of them in captivity. The adult animals soon lose their vitality and in a few months will pine away. If some part of our State that is adapted to the antelope could be set aside as an antelope range, where they would be given absolute protection, it is believed that this species could be perpetuated. If such refuge should be established, it will be necessary to keep sheep from grazing on the land, as antelope and sheep will not get along together. As a rule, the land where antelope is found is almost worthless from the grazing or agricultural standpoint. The antelope is one of the most interesting of our North American game animals, and if by reasonable effort we can save them, we will be well repaid for our trouble.

MOUNTAIN SHEEP.

The mountain sheep still flourish in considerable numbers in the southeastern part of the State. Formerly they ranged over the entire Sierra Nevada region and across into the lower Coast Range as far north as San Luis Obispo County, but they now are restricted to the most inaccessible portions. Professor Grinnel of the University of California has about completed a report on the present status of this magnificent game animal. This report will probably be published shortly by the Commission.

BEAR.

Many of our most valuable animals as yet have received no consideration from the law. The grizzly bear is practically extinct. There are probably not half a dozen left in the State. The common brown or black bear is fairly abundant in some parts. It is for the most part a harmless species, feeding on roots, berries, grubs and insects. Rarely does a bear kill sheep or hogs. Occasionally a sheep-killing bear may be reported, but it is an exception to the general rule. They are naturally timid animals, only becoming vicious when wounded and cornered. The least unnatural sound will cause a bear to run for miles. The pelt of a well colored bear in prime condition is worth from $20.00 to $40.00. The law should not allow their being killed except when the pelt is prime.

FUR-BEARING ANIMALS.

Few people realize the importance of the fur-bearing animals in our State. Each year furs worth nearly $200,000 are shipped to the various fur centers. Under our present law none of the fur-bearing animals is protected. The killing of them is allowed in every season of the year. They are worthless during the summer months but exceedingly valuable during the winter. The killing of the more valuable and least predatory species should be prohibited when their fur is of no value.

WILD DUCKS AND GEESE.

The most abundant game birds in the State are ducks and geese, although neither of them are nearly as numerous as they were in former years. Ducks formerly bred in abundance throughout the entire State. Now, owing to the reclamation of land and also to the late spring shooting, the only species that breed commonly are the cinnamon teal and fulvous tree duck. These species leave the State during the fall months and are not heavily killed by duck hunters. The only places where other varieties breed commonly are in the lakes throughout the Sierra region.

There were killed in California last year approximately one million ducks. These birds cost the hunter at least fifty cents each. Some authorities consider that they cost a dollar. Even at fifty cents, it can be easily understood what the wild ducks are worth to the people of the State. Numerous species of geese are becoming exceedingly scarce. The practice of using live decoys and animal blinds has reduced their numbers to a very small fraction of what they were formerly. Experiments should be carried on to ascertain if the geese do the damage that is attributed to them. A certain amount of pasturing of young grain has been found to increase the crop. It is possible that in some of the grain fields of the interior, the work of the geese has increased rather than decreased the amount of grain produced. Without doubt, the killing of geese should be more restricted than it is at present.

SHORE BIRDS.

Our present law on shore birds is extremely ambiguous. The season should open and close for all species at the same time. The different species are not well known to most hunters and quite often a law-abiding man unconsciously violates the law. To allow the season for any water bird to run as late as the first of May is directly contrary to the advice of men who have made a study of spring shooting. Many of the shore birds are now on the verge of extinction and it would be well to consider taking them off the list of game birds. There is no more harmless group of birds in the State, so far as the agricultural interests are concerned, and from the standpoint of game most of them are not to be seriously considered.

QUAIL.

Quail are slowly decreasing throughout most of the State, on account of the great number of hunters and the development of facilities for getting into all sections where quail are found. One cause of the decrease of quail has been attributed to in-breeding. If there is any merit in this contention, the in-breeding can be attributed to the heavy shooting, reducing the number of birds to below the safety point. In parts of the State there is urgent need of a close season for a number of years if quail are to be kept from extermination. There is some hope that the experiments in domesticating quail, now being tried by parties throughout the State, may be successful. They are comparatively easily raised and would command a very good price from bird

fanciers, if the sale were permitted. Mountain quail can probably be successfully raised above elevations of 2,500 feet. Experiments with them below that level have for the most part resulted in failures. Mountain quail have become very scarce throughout the southern end of the State, and in the coast region below San Francisco. In other parts of the State, although sometimes many of them are killed by hard winters, they are about holding their own.

GROUSE.

Ruffed grouse are fairly abundant in the extreme northwestern corner of the State. On account of the heavy brush and timber in which the birds are found, they are not hunted extensively. The blue grouse is becoming scarcer, and in all parts of the State where the settlers have engaged in sheep raising, they are almost extinct.

The sage hen is found only in the eastern part of the State, in the true sagebrush country. They have been greatly reduced where sheep have been ranged. It has been suggested that we endeavor to introduce the sage hen into Imperial County and other places of low elevation. It is probable that no success would be secured from any experiments of this sort, as the sage hen is practically never found below an elevation of 3,000 to 4,000 feet; neither is it found out of the true sagebrush country. The sage hen is our largest native California game bird and it is to be greatly desired that it be kept from extermination.

DOVES AND PIGEONS.

Perhaps the most difficult bird we have in the State to arrange a proper season for is the common mourning dove. Breeding records show that January is the only month in which they do not nest. No bird should be killed during the nesting season. On this account there are many sportsmen who advocate the removal of the dove from the list of game birds. If the proper season cannot be arranged, then this is what should be done. There is very urgent need for the protection of the wild (band-tail) pigeon. This is the slowest breeding game bird in the United States. One egg is the complete set, and probably only one egg is laid the entire year.

INTRODUCED GAME BIRDS.

Of the introduced game birds, those which have promised the best results are the ring-necked pheasants and wild turkeys. Pheasants have been liberated in various parts of the State where climatic conditions and topography were considered adapted to them. In many places very excellent results have been obtained. In Humboldt County, the birds have increased to a remarkable extent. They have also increased in parts of the Santa Clara and San Joaquin valleys. It will, however, be several years before the ring-necked pheasant can be considered abundant enough to be placed on the open list.

Wild turkeys have been liberated in the lower Sierra Nevada region, where they are reported to be doing exceedingly well. Other plants have been made in San Diego, San Bernardino, Monterey, San Benito,

Alameda, Sonoma, Shasta, and Humboldt counties. Reports that have come in are very promising and we believe that before many years the wild turkey will be one of our most prized game birds. A report of the turkey plantings made in the southern Sierra, by Deputy A. D. Ferguson of Fresno, will be found in the Board's 1913 Game Bulletin No. 1.

Hungarian partridges have been given a good trial but as yet no success has been met with. There have been very few places where they have been seen in recent months. It is possible that the Hungarian partridge will show up in unexpected places and that we may yet have this bird permanently within our State.

GAME REFUGES.

As game becomes scarcer and hunters work farther and farther into the breeding country, it will become more and more essential that certain places be left where game can have an absolute refuge. From these refuges game will spread to the surrounding open country where the hunters may have a chance to secure a fair bag. The more numerous these refuges can be, the more game will there be for the people of the State. The benefits that are to be derived from a protected area of this sort are well shown in San Mateo County. In that county there are approximately 20,000 acres of Spring Valley Water Company land. On this land there is practically no hunting. The deer are undisturbed here at all times. In the fall of the year the bucks begin to travel and may be found in every part of the county. During the present year there were killed about 154 bucks. Were it not for the Spring Valley preserved land, it is safe to say that not one tenth of this number would have been taken. If a game refuge could be established in every county in the State, we would be sure of a perpetual supply of game. There are many places that could be easily acquired at present, but as more settlers work in it will be more and more difficult, so that the time to commence is now.

GAME REARING.

In this connection it is well to say a word concerning domestic propagation of game. As it becomes more and more necessary to remove all the wild game from the markets, the public demands something to take its place. This can well be supplied from that raised in captivity. We have thousands of acres of land in this State that is excellent range for deer and upon which few of our domesticated animals can survive. This land, when properly fenced, would bring in a steady income as deer farms. Venison is one of the most delicious of all meats, and would command a high price at all times. The writer is informed by one of the leading butchers of San Francisco that he could secure from $1.00 to $1.50 per pound for all the venison he could obtain. Both deer and elk are readily domesticated. A law allowing the sale of such animals would not make it any more difficult to protect the wild animals; on the other hand, it would supply the demand for venison and would remove the

reason for violating the law that sometimes exists under our present system. Not only can big game be domesticated, but quail, wild ducks and other game birds can be profitably raised. It would be well for our State to adopt a law something similar to that in force in New York, which allows the raising of game and the sale of all wild game other than that native to America.

CROP DAMAGE BY GAME.

There are parts of our State where deer and small game do considerable damage to growing crops. At present there is no provision in our law that allows the killing of such animals, nor is there any provision made for the payment of damages to the owner of the crops. It would not be wise to allow the killing of game animals on account of the very numerous parties who would take advantage of the opportunity to kill game at all seasons of the year, so that some system of appraising the damage done and the compensating of injured parties is the only solution.

PREDATORY ANIMALS.

The worst game destroyers that we have are the mountain lions, coyotes and bobcats. The lion works chiefly on deer; the coyote and cat on fawns and small game. It seems impossible to devise a bounty law through which the State would not be robbed. Almost every state in the Union has tried it at different times, and nothing but failures have resulted. All these species of "varmints" do damage, not only to the game of the State, but to the stock and poultry interests, so that it would not be fair to pay a bounty out of the game protection funds entirely. If any sort of a system is devised, the money should be taken from the general fund of the State.

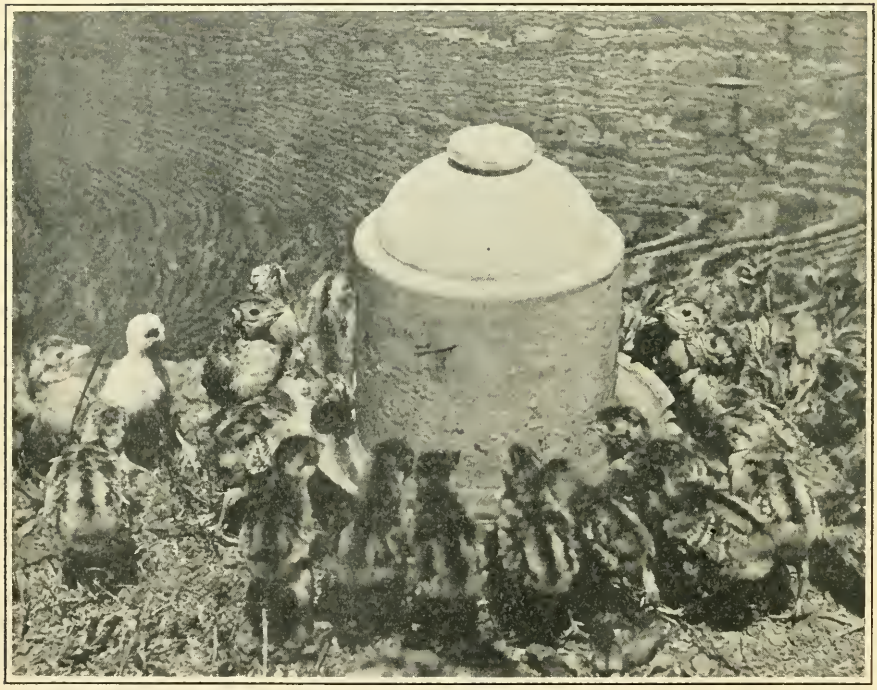
A sum of money could be placed at the disposal of the Fish and Game Commission, out of which a number of expert trappers could be paid—these men put to work systematically in parts of the State where "varmints" are most abundant. The wages of such trappers need not be great, as the men could be allowed to retain the pelts taken. By a strenuous campaign it would be possible to bring the "varmints" to below the danger point, and enough game and stock would be saved each year to more than pay for the money expended.

OPERATION OF STATE GAME FARM AT HAYWARD.

By Wm. N. Dirks, Superintendent.

I herewith beg to submit my report as Superintendent of the State Game Farm. for the season of 1912.

On account of the unsatisfactory results obtained in years past, when all eggs were hatched under the domestic hen, it was decided to learn if more satisfactory results could not be obtained by the use of incubators. A great deal of time was spent in reading what various authorities have written on this subject; but it was found that their reports



Pheasant chicks watering.

were more or less contradictory, and that only in a general way could they be relied upon. It was then determined to go ahead with actual experiments.

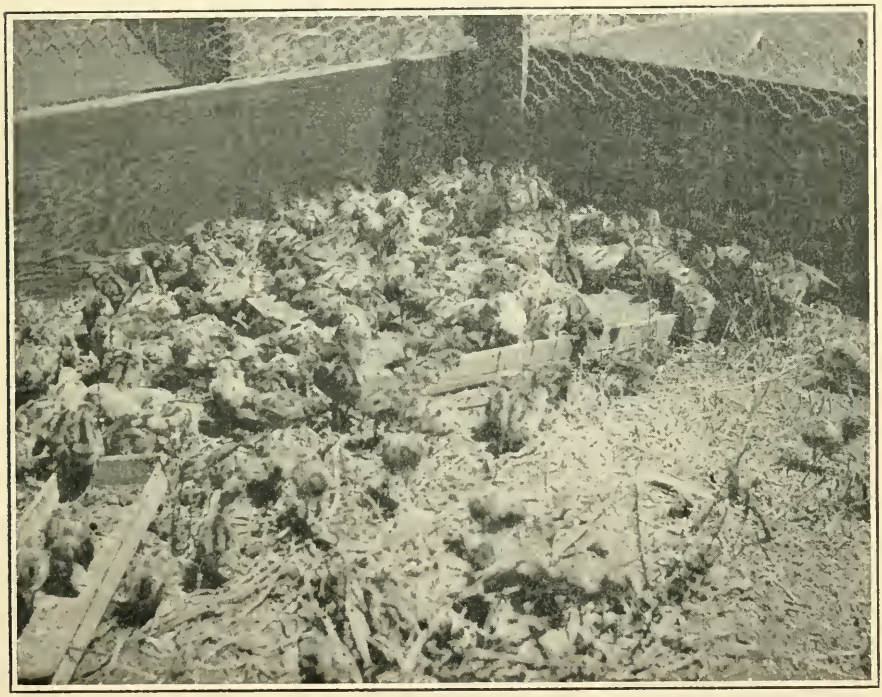
Various makes of incubators were tried and all were found to give about the same general results. Eggs were first placed in the incubator during March. Out of 13 eggs but 5 hatched—a percentage of a little over 38. Of the next lot of 517 eggs, 367 hatched, or nearly 71 per cent. Three other lots were tried, with poor success—only 40 per cent hatched.

It was then decided to set the eggs under hens for a number of days,

before transferring them to the incubators. Of the first lot of 1,100 eggs so placed, 822 hatched—a greater percentage than had been secured by the use of the incubator alone. Even better results were obtained later; out of a lot of 500 eggs, 411 were hatched, or 82 per cent.

It is a general complaint among pheasant breeders that the eggs laid toward the end of the season are weaker in fertility than those laid earlier. This has not been the case with the eggs hatched at the Game Farm during the past season; for of the last 123 laid, 100 were fertile.

It is planned, for the next year, to carry on experiments in coöperation with the State University, at the State Farm at Davis, to see if



Pheasant chicks in brooder yard at Game Farm.

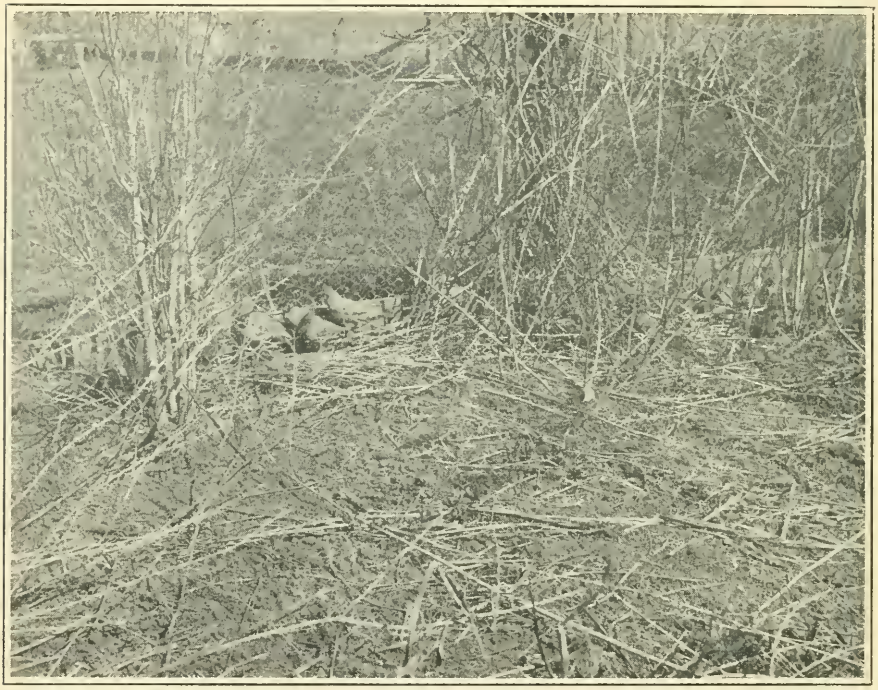
satisfactory results can not be obtained with incubators alone, thus abandoning the use of hens.

Although the trial with incubators has not met with the success that was hoped for, the artificial brooder, on the other hand, has given entire satisfaction, and has proved to be far ahead of any natural method for the raising of birds in large numbers. The brooder-house is a building divided into five compartments, opening into screen runways, 8 feet wide by 90 feet long. At one end of the building a furnace is set in a shallow pit, and leading from it a terra cotta pipe laid in a trench runs the entire length of the building. This pipe is boxed in, and

covered with sand. By this arrangement a very even temperature can be maintained at all times.

The young pheasants are removed from the incubator as soon as dry. When the hatch is irregular, the older chicks may be taken out several hours in advance of the smaller ones, without harmful results.

Food is placed in reach of the little fellows within a few hours after they are taken from the incubator. For the first few days they are given a boiled custard, made in the proportion of six eggs to a pint of milk; after a day or two a small amount of cornmeal is added to this custard, and later, corn grits and fresh chopped beef. Hemp, mustard,



Valley quail in pen at Game Farm.

and canary seeds are also scattered in the pens, and after the chicks are a month old, wheat and charcoal are added. Sand and green food, such as lettuce, kale, and clover, are placed within reach of the birds at all times.

After five weeks in the brooder, the birds are strong enough to be transferred to outside pens, and almost any time after they are eight weeks of age they are ready for liberation. About this time, there is a tendency to pick each other's feathers, with the result that as soon as blood shows, the injured bird becomes an object of attack by all the other birds in the pen, and in most cases is killed.

In securing eggs, the breeding birds were confined in small pens—

one male to five hens, except in two pens, where eight and ten hens respectively were confined. From both of these pens eggs were taken equaling in fertility those taken from the pens in which there was a lesser number of female birds. Experiments along this line will be carried on during the next summer.

In raising pheasants it is very important to guard against the young birds' getting hold of any of the burrs of the burr clover, as these burrs lodge in the throat and if not removed—an operation that can be performed with the aid of a small pair of physician's forceps—will cause death.

On account of the difficulty of securing valley quail for breeding purposes, a fair test was not made with these birds, though it is believed that they can be easily raised. Of the few eggs secured, 90 per cent of those that were fertile hatched. As soon as hatched the chicks were put into a fireless brooder made of feather dusters. Ninety were raised out of 181 hatched. Extensive experiments in the raising of valley quail will be carried on during the next year.

No success attended experiments with the Gambel or desert quail. All but three of the female birds died, and on dissection it was found that although eggs had developed, owing to some unknown trouble, probably due to a change in climatic or food conditions, the birds were unable to lay them. The male birds are more hardy and practically none have died.

No attempt was made to raise a great number of wild turkeys, as the stock at the farm has been greatly run down. These birds are easy to raise and should new breeding stock be secured next year a great many birds could be raised for liberation.

PROPAGATION AND DISTRIBUTION OF FISH, SEASON 1910-1911.

SALMON PROPAGATION.

In 1910, during the months of October, November, and December, the Fish and Game Commission received as usual from the U. S. Bureau of Fisheries, a grant of 24,126,000 salmon eggs which had been spawned at the Federal hatcheries at Baird, Battle Creek, and Mill Creek. These eggs were received and cared for at the State hatcheries at Sisson, Eel River and Brookdale.

Those hatched at Sisson were liberated in the tributaries of the Sacramento, near the hatchery, with the exception of 2,215,000 which were taken down to Redding and liberated in the Sacramento. Those hatched at the Eel River Hatchery were liberated in that stream within a few miles of the sea, and those hatched at Brookdale were planted in Scott Creek and the San Lorenzo River.

In addition to the above grant, 2,109,000 of silver salmon eggs were obtained through the joint operations of the Commission and the Bureau of Fisheries, on Klamath River, near Klamathon. The eggs of the silver salmon were shipped to Sisson and hatched there, with the result that 700,000 young silver salmon were planted in Klamath River and 719,000 in the Sacramento River. This was the first effort made in this State to increase the runs of the silver salmon; heretofore hatchery propagation having been confined to the Quinnat, or Sacramento salmon.

The silver salmon, commonly called "Coho" in the north, apparently does not enter either the Sacramento or the San Joaquin rivers. There is no known reason why the fish should not enter these streams; they run abundantly in the Klamath and the Smith rivers, in Del Norte County; they are taken in considerable numbers in Eel River, in the fall; and they frequent many other of the coast streams, as far south as Monterey Bay. Strange as it may appear, the presence of the silver salmon in the waters of this State remained unnoticed until Dr. Gilbert, Professor of Zoology, at Stanford University, a few seasons ago called attention to them. Heretofore, all the salmon taken in our rivers have been commercially classed as Quinnat. The silver salmon—though a true Pacific salmon—is not considered as valuable a fish as the Quinnat; they are smaller, run late in the fall, and are lacking in color and in oil. Nevertheless they are an excellent food fish when taken as they enter the rivers from the sea. Though the silver salmon run neither into the Sacramento nor the San Joaquin rivers, as an experiment the Commission planted 719,000 in the Sacramento, at Redding, with the hope of establishing a run in that river of these desirable fish. The outcome of the experiment will be watched with interest.

TROUT EGG COLLECTION AND DISTRIBUTION.

During the winter and spring of 1910–1911 the Commission obtained from the stock fish in the breeding ponds at the Sisson hatchery, the following numbers of trout eggs:

Loch Leven trout	1,200,000
Rainbow trout	1,100,000
Eastern Brook trout	750,000
	3,050,000

In addition to the eggs collected from the stock ponds at Sisson, two spawning stations were operated on the Klamath River, for the collection of wild rainbow trout eggs; these stations obtained 2,500,000 eggs, which were eyed and shipped to the Sisson Hatchery. A station for the collecting of steelhead trout spawn was also operated at the Snow Mountain Power Company's dam, in Eel River, and 1,900,000 eggs were collected there, 300,000 of which were paid to the California Trout Farm Company, which holds the leases for operating at that dam. Three hundred thousand of the eggs taken at the latter place were shipped to the State hatchery at Grizzly Bluff, on Eel River, in Humboldt County, where they were hatched. The fry from this lot were distributed in that county. Seven hundred thousand of the eggs were shipped to the Ukiah Hatchery, which the Commission held under lease. This lot supplied fish for Mendocino, Sonoma, Marin and Lake counties. The balance of the eggs was shipped to Sisson, where they were hatched and planted in public waters. The Commission also operated the Scott Creek spawning station, owned by the county of Santa Cruz, upon a lease, under the terms of which the county hatchery at Brookdale was furnished 500,000 eyed steelhead trout eggs, from a total of 1,300,000 steelhead eggs taken at this station, 600,000 of them being shipped to Sisson, to be used in stocking public streams.

Owing to unfavorable weather conditions, only 130,000 steelhead trout eggs were collected at Grizzly Bluff, Humboldt County, but the output of that hatchery was increased by the shipment already mentioned.

In all, 5,800,000 steelhead trout eggs were collected during the season.

The season at Tahoe was much later than usual, owing to the excessive snow fall of the previous winter. Operations were begun there in May and 3,000,000 Tahoe trout eggs were collected, which were hatched at the Tahoe and Tallac hatcheries and planted in the lakes in the immediate vicinity.

The hatchery at Wawona, Yosemite National Park, was operated as usual, with eggs shipped from Lake Tahoe.

The total number of trout eggs collected for the year amounted to 11,980,000.

(This report is taken from a bulletin issued by the Board in 1911.—SECRETARY.)

REPORT OF SUPERINTENDENT OF HATCHERIES.

Honorable Board of Fish and Game Commissioners,
for the State of California.

GENTLEMEN: I take pleasure in submitting my report of the work done at the Sisson Hatchery and other State hatcheries during the season from December 1, 1911, to November 1, 1912; and also of my work as Superintendent of Fish Culture and Distribution. I have made monthly reports of all this work, which covered in a comprehensive way everything that was being done under my supervision. I shall, therefore, endeavor to cover in this report only such matters as will be of interest to the public or those especially interested, but perhaps less informed than your honorable Board.

The work in general is in a most satisfactory and prosperous condition, due in a very great measure to the substantial support and coöperation I have received from the Board of Commissioners. I have been in the employ of the Commission for almost thirty years, and this is the first time during that period that I have received the hearty coöperation of the entire Board. I attribute in no small measure the success of the past season to this source, and I am deeply grateful for all the encouragement and material assistance thus given.

THE SISSON HATCHERY.

The excellent condition of the buildings and surroundings at the Sisson Hatchery enabled us to escape the usual heavy expense of the past few years of the building of new structures. The fences had a new coat of paint, as did also the exterior of hatchery "A," and all of the troughs in each hatchery were newly painted. A few new flumes have been built, and new gravel bottoms have been put in some of the ponds. A great deal of ugly brush has been removed, thus putting the ponds in a neater looking, as well as more sanitary condition. The roofs of all the buildings were repaired and a new motor was installed in the feed house.

At Bogus, Shovel and Camp creeks, small egg collecting stations under the supervision of this hatchery, the buildings, traps and screens were given a thorough overhauling and at Bogus creek an addition was built to the dwelling occupied by the men during the egg collecting season.

THE DISTRIBUTION CAR.

The distribution car also came in for its share of improvements. The boiler and air pumps especially were in poor condition and in April the car was sent to the Sacramento car shops of the Southern Pacific Railroad. The aerating system was improved by doubling the number of aerating plugs in each unit, thus insuring an abundance of oxygen in each can. The fish have carried better this season than ever before. Reports received from nearly all of the applicants made mention of the excellent condition of the fry at the time of delivery.

CREATION OF NEW OFFICE.

In November, 1911, the Commission saw fit to create the new office of Fish Culture and Distribution, and I was assigned to this new division of the work. I entered upon my new duties with great interest and enthusiasm. The work at first was somewhat heavy; but I was able with the excellent assistance given me, to effect a successful organization of this new department. The duties of this work required me to be away so much that the Commission very kindly furnished me with the valuable assistance of R. W. Requa who in April was made assistant superintendent of the Sisson Hatchery. He has very ably conducted the work of this station during my long occasions of absence while I was away on tours of inspection into every section of the State.

THE HATCHING SEASON AT SISSON HATCHERY.

The season for hatching here and at the substations has been unusually successful, and I submit herewith a tabulated list of the varieties and numbers of trout hatched:

LOCH LEVEN TROUT.

Eggs taken		1,500,000
Loss in eyeing and hatching		206,500
Left for distribution		1,293,500

EASTERN BROOK TROUT.

Eggs taken		1,000,000
Loss in eyeing and hatching		94,000
Left for distribution		906,000

RAINBOW TROUT.

Eggs taken from hatchery pond fish	1,087,000	
Loss in eyeing and hatching	97,830	
Left for distribution		989,170
Eggs taken Bogus Creek Station	2,455,400	
Loss in eyeing and hatching	280,000	
Left for distribution		2,175,400
Eggs taken Camp Creek Station	2,181,600	
Eggs shipped to Wawona Hatchery	225,000	
Loss in eyeing and hatching	262,700	
Left for distribution		1,693,900
Eggs taken Shovel Creek Station	1,370,000	
Loss in eyeing and hatching	177,800	
Fry planted in Shovel Creek	100,000	
Left for distribution		1,092,200
Total		5,950,670

STEELHEAD TROUT.

Eggs received from Brookdale	416,600
Loss in hatching	55,600
Left for distribution	361,000

LARGE LAKE TROUT—(*Salmo m. tahoensis*).

Eggs received from Tahoe	92,922
Loss in hatching	8,922
Left for distribution	84,000

BLACK-SPOTTED TROUT—(*Salmo m. henshawii*).

Eggs received from Tahoe	370,164
Loss in hatching	51,664
Left for distribution	318,500

SALMON.

The salmon output, while not so heavy as in several previous seasons brought many pleasing results. Several experiments have been made and some 50,000 fish were marked in endeavors to find the most favorable points for the distribution of these fish. After years of investigation I am of the opinion that the only successful way to rear salmon is to hold them from five to seven months and then release them in our rivers before the flood season. At this age they are able to escape their enemies and take care of themselves until they have reached the end of their long journey to the sea. By releasing them early, when the temperature in the streams first lowers, and before the flood season, they depart for their natural waters under most auspicious circumstances, and with no danger of being carried by the floods into the overflow basins and left later to perish in the tule basins when the flood waters have receded.

The Federal Bureau is making arrangements to take the eggs of the Silver salmon at Klamathon this year. They will be hatched at the Sisson hatchery.

The output of salmon follows:

Eggs taken at Battle Creek Station and hatched at Sisson	5,890,000
Loss	105,145
Left for distribution	5,784,855
Hatched at Sacramento Experimental Station	450,000
Loss in shipping and hatching	92,300
Left for distribution	357,700

Following is a list of trout and grayling in the ponds at Sisson Station, November 1, 1912:

LOCH LEVEN.

Adult	3,402	
Two year old	3,572	
One year old	10,500	
Fry	10,000	
		27,474

EASTERN BROOK.

Adult	4,078	
Two year old	4,490	
One year old	5,879	
Fry	17,500	
		31,947

GOLDEN.

Yearlings	250

GRAYLING.

Fry	4,000

HYBRID GOLDEN-RAINBOW.

Adult	57

RAINBOW.

Adult	3,310	
One year old	2,000	
Fry	25,000	
Fry in Klink Lake	50,000	
Fry in Sisson Lake	75,000	
		155,310
Total		219,038

TAHOE HATCHERIES.

E. W. Hunt has successfully managed the hatcheries about Lake Tahoe for many seasons. He proceeded to the lake a little earlier than usual this year so as to be in readiness to take as many eggs as could possibly be accommodated at the Tahoe Hatcheries.

There has been a very large trout that entered some of the tributary streams of Tahoe to spawn. I believe these to be a different variety, if not a different species from the common black-spotted trout (*Salmo m. henshawii*) of Lake Tahoe. These large fish have never been artificially propagated, owing to the lateness of the season when spawning usually begins. It was my desire to procure a few thousand of these eggs and place the fry hatched from them in different waters to see if they attain the size and peculiar markings after they have come to maturity under different conditions that are attained in their native waters. These fish have been classified as the *Salmo tahoensis*.

Mr. Hunt succeeded in getting over half a million of their eggs. Of these 92,922 were shipped to Sisson and hatched, and have since been distributed to various waters. The remaining eggs at the Tahoe Hatcheries were hatched and distributed to various tributary streams of Lake Tahoe. I am waiting with a great deal of interest the results of the artificial hatching of these large trout and also the effects of transplanting them to foreign waters.

Another important feature in connection with the Tahoe work was the exchange of 50,000 rainbow trout eggs to the Verdi Hatchery in return for as many Eastern brook eggs. The Eastern brook eggs were hatched and at the age of eight months were in fine condition and were distributed. The rainbow eggs will be delivered to the Verdi Hatchery next spring.

After a very busy and successful season the Tahoe Hatchery closed on October 7th and Mr. Hunt, after a short vacation, proceeded to Sisson. The statistical report follows:

Black-spotted trout eggs taken		3,610,622
Large lake trout eggs taken		542,761
Total eggs taken		4,153,383
Eggs shipped to Sisson and Wawona	585,086	
Loss in eyeing and hatching	482,439	
		1,067,525

Fry planted as per distribution reports:

From Tallac	1,617,072	
From Tahoe	993,137	
From Glen Alpine	475,649	
		3,085,858
Total		4,153,383

BROOKDALE HATCHERY.

The Brookdale Hatchery, which has hitherto been operated by Santa Cruz County, has recently been acquired by the State through a lease. Owing to a lack of funds for maintaining this hatchery, Santa Cruz County entered into an agreement with the State, turning over the station, in return for the delivery to that county annually of 500,000 steelhead trout eggs.

Mr. F. A. Shebley has managed this hatchery since its institution and has continued as its superintendent since it has been acquired by the State. The eggs which are hatched at Brookdale are taken mainly from Scott Creek. An insight into the history of this station is necessary, therefore, in order to fully understand the importance of what has been accomplished there.

Concrete dams were first placed in the creek in the fall of 1907 by Santa Cruz County at a cost of $650.00. The following spring 725,000 eggs were taken. To make it a well equipped egg-collecting station considerable more work was needed; but an insurance of enough eggs in future had to be guaranteed in order to justify the cost. The only way to obtain this assurance was to protect the small trout in a portion of the stream and lagoon from hook and line fishermen. Leases were therefore secured from owners of land on that portion of the lagoon and stream, whereby four miles of stream was acquired and closed to fishermen. Here the fish are protected until maturity. Results have shown that by protecting that portion of the stream an increase of two million eggs was secured this season over the first season and with no greater cost of operation.

In addition to the importance to which he has elevated this plant as an egg collecting station, Mr. F. A. Shebley deserves great credit for the study and experiments he has pursued regarding fish life; they are instructive and interesting and represent a vast amount of well spent time and thought.

The egg-collecting station at Scott Creek was enlarged so as to take an extra number of steelhead eggs. Shipments of these eggs were made from Brookdale to the Ukiah Hatchery, to the Eel River Hatchery for distribution in Eel and Mad rivers and other nearby streams. Shipments were also made to Sisson for distribution by car to Southern California waters. The remainder were kept at Brookdale for distribution to points in Santa Cruz County streams.

Further improvements will be necessary to increase the take of eggs this coming spring at Scott creek. The report of the season's work at Brookdale follows:

Total number eggs collected at Swanton, hatched at Brookdale	2,709,300
Loss	603,200
Left for distribution	2,106,100
Total number of eggs shipped to Ukiah Hatchery	470,000
Total number of eggs shipped to Price Creek Hatchery	400,000
Total number of eggs shipped to Sisson Hatchery	416,600
Two small lots to Sacramento Experimental Station	16,000
Fry planted Scott Creek	50,000
Fry planted Santa Cruz County	753,500
Total	2,106,100

PRICE CREEK HATCHERY.

Mr. W. O. Fassett has continued in charge of the work at this important station and has directed it in an orderly, commendable manner; but a series of accidents have hampered the work here to a great extent.

In April a landslide damaged the flumes so much that the hatchery had to close. The eggs and embryo fish in the hatchery were planted in Price Creek. Several hundred dollars will be necessary to repair the water supply so badly damaged by the landslide.

It may be well to note that 100,000 salmon fry were liberated in Mad River this season. The people in this section were greatly pleased, claiming to have been entirely overlooked by former commissions. In response to a petition of the people of Arcata, a thorough study is being made of the conditions in Mad River relative to the propagation and distribution of salmon fry in that section. I believe that enough eggs can be taken to stock Eel River and Mad River, without planting there the eggs of the Sacramento River.

The report of the steelhead trout eggs taken and the early distribution on account of the landslide follows:

Eggs taken		218,000
Eggs received from Brookdale Hatchery		400,000
Total		618,000
Loss in eyeing and hatching		38,000
		580,000
Planted in Price creek:		
Embryos	454,000	
Eyed eggs	80,000	
Uneyed eggs	46,000	
Total planted		580,000
Salmon eggs received from Bureau of Fisheries		3,240,000
Loss		36,340
Left for distribution		3,203,660
Distributed in Mad River	100,000	
Distributed in Eel River	3,103,660	
Total		3,203,660

UKIAH HATCHERY.

As in several previous years, the work at Ukiah has been very capably handled by Mr. A. V. La Motte. The hatchery was repaired early in the season, and a motor was installed for a pumping plant, to insure a supply of water in case the supply in the creek should fail. The expense of purchasing the pump and wire for the power line transmitting the current to the motor was paid for by subscription by the citizens of Ukiah. The fish have suffered at this hatchery in former years on account of the failure of the water supply. The present season, however, has brought with it an ample supply of water, and the station has operated successfully for four months.

The work at this station, while not so extensive as at some of the other stations, is a credit to the Commission; Mr. La Motte deserves unstinted praise for the businesslike and creditable manner in which he has conducted the work and made his reports. The residents of this section are also entitled to the gratitude of the Commission for their generous coöperation and support.

The egg-collecting station on Eel River, Mendocino County, was not opened this season. The Marin County Trout Farm demanded 600,000 eggs for permitting the Commission to operate at the Snow Mountain Power Company dam, on which they hold a lease. The Commission considered the demand unjust and that granting it would be favoring private interests, so enough eggs were shipped to Ukiah from Brookdale to supply the streams in that section.

The following briefly sums up the output of this station:

Steelhead eggs shipped to Ukiah from Brookdale Hatchery		470,000
Loss of eggs and fry		36,542
Left for distribution		433,458

WAWONA HATCHERY.

The work at the Wawona Hatchery, superintended by Mr. F. C. Boyce, has been entirely satisfactory, and like that at all the other hatcheries, the season has been a busy one.

The eggs shipped to this station from the Sisson and Tahoe hatcheries hatched in good condition, and the fry were vigorous and healthy. Through the courtesy of Major W. H. Forsyth, superintendent of the Yosemite National Park, the fish were given a wide distribution through the Yosemite National Park and adjacent country during the month of July. The greater portion were distributed by pack animals in the lakes and streams of the Yosemite region.

The following report sums up the season's work at the Wawona Hatchery:

Rainbow eggs shipped from Sisson to Wawona	225,000	
Loss in hatching and rearing	8,994	
Left for distribution		216,006
Black-spotted trout eggs shipped from Tahoe to Wawona	122,000	
Loss in hatching and rearing	7,534	
Left for distribution		114,466
		330,472
Rainbow trout fry distributed	216,006	
Black-spotted trout fry distributed	114,466	
Total distributed		330,472

THE SACRAMENTO EXPERIMENTAL STATION.

During the fall of 1911 the Commission decided to carry on a series of experiments to determine whether the eggs of the quinnat salmon could be successfully hatched and the fry reared near the city of Sacramento. It was thought that if water could be found in which the eggs could be hatched without causing injury to the eggs and embryos, that a greater percentage of the fry would safely reach the ocean, than would be the case if they were all liberated in the upper reaches of the river near the natural spawning grounds. It was maintained that under the old system of liberating the fry as soon as they were able to swim, that a great many of them were devoured by predatory fishes, and others were carried into the overflow basins during years of flood.

Accordingly, the station at Sacramento was established. Mr. F. A. Shebley conducted the work in addition to his duties as superintendent of the Brookdale Hatchery. The experiments as carried on at Sacramento are of vital importance to the salmon industry. After experimenting with the water from a number of wells, a flow of water was found on the Sherburn tract that appeared to give average results in hatching. The fish hatched at this station were all released in the Sacramento River. Of these, 50,000 were marked. A close watch will be kept for the return of these fish when they return at maturity, to find out if a greater percentage return as mature salmon than those that are released on the upper reaches of the Sacramento River.

Nearly all of the fry that were liberated in the Sacramento River were floated in a screen cage by boat into the middle of the stream and there released. Mr. N. B. Scofield, however, took 500 in a floating box down the river, where they were held and fed for several weeks in brackish and salt water. They were not affected by the sudden change from fresh to brackish and then to the saline waters of the straits near the outlet of the bay. Mr. Scofield, who conducted the experiment, will furnish a report of the minor details of this work.

In order to accurately determine whether better results are obtained by hatching and releasing the fry nearer tidewater than are obtained under the old system, it will be necessary to operate this station for a number of years. A certain number of fry will be marked each year until conclusive results are obtained.

In the course of the experiments above mentioned and in the search for suitable water for hatching purposes, two wells were bored, and the water from other wells was also analysed and experimented with. The batteries or series of troughs used in these experiments were set up in the open near the wells and the pumping plants were installed temporarily. The best results were obtained from the well on the Sherburn tract. Here a battery of 40 troughs was set up on the levee, and the pumping plant installed in a small building of corrugated iron. As the work continues during the coming season it will be necessary that a tent or temporary building be erected over the hatching battery, and I respectfully recommend that these few improvements be made in order

that the employees may be protected from the inclemencies of the weather. If the experiments of the coming seasons prove successful, then a permanent station should be erected and the work carried on extensively. A report of the eggs hatched and released follows:

Total number of eggs received from U. S. Commission, Baird, Battle Creek and Mill Creek		1,768,000
October 9—First experiment, eggs placed in experimental trough, Carmichael land; water being unfit. Loss	50,000	
October 21—Second experiment. Ohji well, 10,000 eyed eggs, 11,000 green eggs. Both lots hatched in good condition, making fine growth after feeding	21,000	
January 6—Third experiment. Levee well, water unfit. Poor results	200,000	
January 10—Fourth experiment. Used river water by pump. No results	50,000	
January 26—Reshipped to Sisson	450,000	
January 26—Loss in hatching and rearing balance of eggs with water taken from Ohji well	97,000	
January 26—Fry liberated in Sacramento River	900,000	
		1,768,000

MILL CREEK.

This station is the property of the Federal Bureau, but it was operated this year by the California Commission. Heretofore, the salmon eggs have been hatched largely at Sisson, and as the prospects were unusually promising for the season passed, it was feared the capacity of the Sisson Hatchery would be overtaxed. Accordingly, arrangements were made with the Federal Bureau whereby the State operated the Mill Creek Station. This station has many fine features, and is ideally situated for the hatching of salmon fry. Below the mill there is a mill-race 25 x 30 and containing from 3,000 to 5,000 miners' inches of water. It is covered with medium-sized boulders and gravel, and here were distributed the surplus embryos and later the fry. It has proved to be a remarkably fine nursery.

Geo. L. Hopper has been in charge of the work at this station, and he has submitted the following report of the season's work:

Eggs turned over to the State	9,364,550
Loss	40,660
	9,323,890
Eggs shipped to Sacramento	607,000
Fry hatched at Mill Creek Station	8,716,890
Fry lost	53,660
Fry planted at Mill Creek	8,663,230

In addition, there were 11,000 green eggs delivered to Mr. Hunt before the State assumed charge of the operations here. There were also 150,000 eggs sent to Sacramento from Baird.

THE DISTRIBUTION SEASON.

The season of distribution has been a long one. The first shipments were of salmon fry and were made in March (1912). Since then the car and its crew under the management of F. McCrea, have been kept constantly on the move, with the exception of ten days in April, when the car was in the shops.

In August the water in the coast streams and southern California became so extremely low that trout distribution had to be discontinued for a time. The car crew then proceeded to collect and distribute black bass. This work was not altogether easy, but they managed to gather 1,750 of these fish. They were planted mostly in interior waters south of San Francisco, but there was one shipment each to Placer, Yolo, and Calaveras counties.

I have submitted to the Commission for publication, a complete tabulated list of all the fish distributed from Sisson Hatchery and the other hatcheries, and it will appear elsewhere in the biennial report. This I deem most important, because the people are not only interested in knowing how many fish are propagated and distributed, but they also want to know where they are planted. The list will satisfy all of these interested persons and will prove that the Commission is endeavoring to scatter its benefits equally amongst all sections of the State.

In a very general way this report covers the work at Sisson Hatchery and its auxiliary stations.

SCREENS AND LADDERS.

Acting under the instructions of your honorable Board, I began early in May, work on the fish "ladder" and screen investigation and the work of having necessary structures and appliances installed.

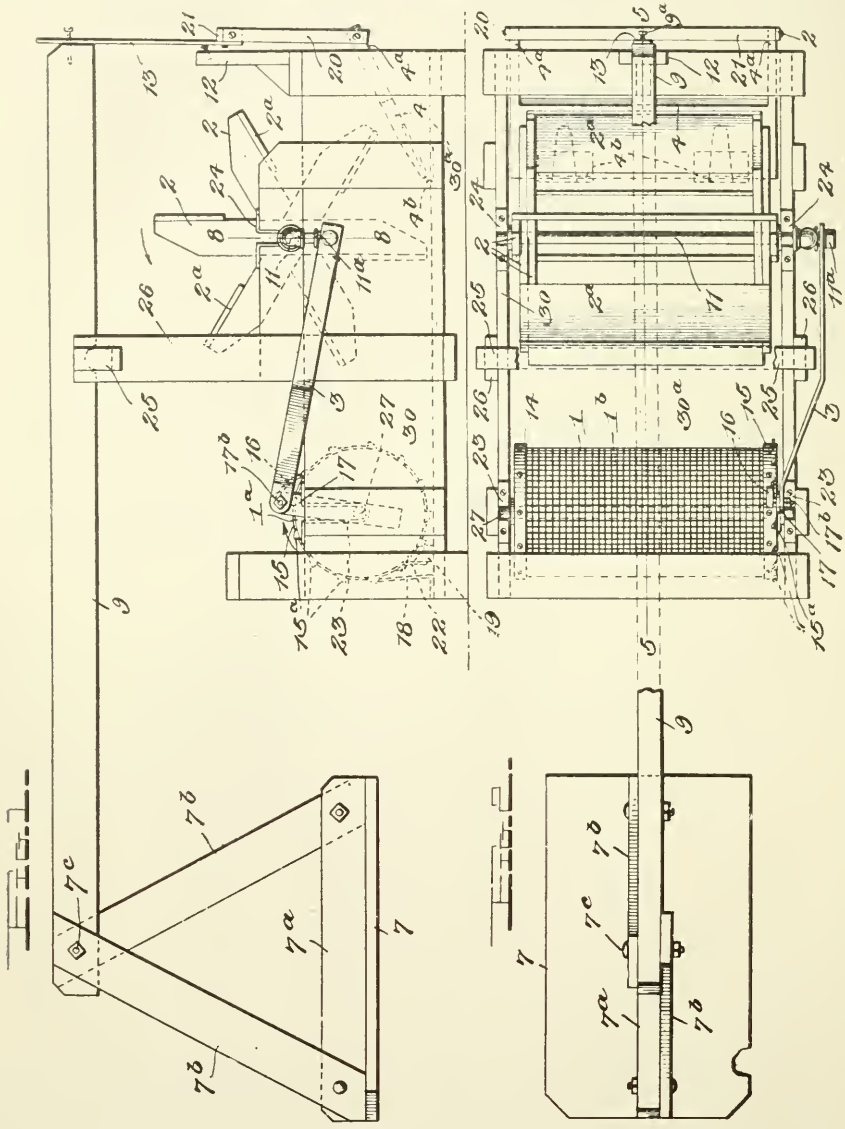
On my recommendation you appointed A. E. Doney as my assistant in the "ladder" and screen investigation. Mr. Doney has had several years of experience in the Klamath River work besides his duties as deputy in the northern part of the State. He has made a special study of the "ladder" work and has proven to be a valuable assistant.

We have visited most of the corporations, mill owners, irrigation and land companies and other water users, from Siskiyou to San Diego, in every county but two, and will have visited these two before this report is issued. On most occasions I have found them courteous and willing to install whatever screens or ladders were necessary.

There has been a screen law in California nearly twenty years and this is the first Commission that has insisted on its enforcement. The work in this line therefore has necessarily been slow. What has been neglected and lying dormant for so long can not be corrected in a month or even in a year.

It has been claimed by many who are familiar with the screen question, that the use of screens with meshes small enough to exclude trout fry would, in many cases, practically shut off all the water from the

ditch or canal in which fry were placed. After a careful study of hundreds of ditches and canals and the matter that is carried into them, in the form of algæ, leaves and grasses, and floating material generally, I am firmly convinced that the parallel bar screens can be placed in all the ditches and canals without working a hardship or inconvenience on



Partial Description of Self-Cleaning and Automatic Adjusting Fish Screen, designed by R. W. Requa, Sisson, California.

any person or company. When we first began this work we recommended the parallel bar screen and any of the rotary screens that the ditch owners desired to put in, so long as the meshes met the regulations of one quarter of an inch. Since then several engineers have planned

automatic self-cleaning parallel bar screens that can be installed successfully in any of the canals no matter how wide or deep they are.

Practical experiments have been made by Superintendent Requa at the Sisson Hatchery and he now has in operation there, two working models of self-cleaning rotary screens. He himself is the inventor of one, and he is entitled to the credit of making the best rotary screen that has ever been devised. Its most important feature is its absolute simplicity and inexpensiveness. It is so constructed that any farmer could make one in his work shop in half a day. I have neither the time nor the space to take up more fully the minute details of this screen. It is my intention to circulate information on this subject by separate folders.

This screen is designed for use in irrigating ditches, canals, or pipes taking water from streams, reservoirs, or other bodies of water.

The purpose of this invention is to provide a fish screen of simple construction, equipped with an automatic regulating device which will maintain a mean water level on the face of the screen under variable heads of water. The driving apparatus, including a crank shaft, pawl and rachet members, is designed for construction without special tools and at a nominal cost.

It may be well to add here that the regulation insisted upon requires that streams inhabited by trout, salmon, shad, and striped bass require screens with openings not greater than one fourth of an inch. In streams frequented by black bass, Sacramento perch and California "pike," and where there are no salmon, shad, trout, or striped bass to protect, an opening of one half an inch square is permissible.

I have found that the reluctance in screening is more with the engineers, superintendents or water masters, than the directors or real owners in land companies. Notice has been served to all water users that the law will be enforced. When a reasonable length of time has elapsed and no intention is shown to comply with the law, I shall request your honorable Board to instruct the Commission's attorney to begin proceedings to compel the obstinate ones to comply with the law.

In our study of the "ladder" question we are finding that most of the opposition to the construction of efficient fish "ladders" is not on account of the expense entailed in construction. In many instances, and particularly is it the case with large power companies, non-compliance is because they do not want to allow sufficient water to pass through the ladders to make them operative, so as to support and preserve the fish life in the streams below the plants. Several companies were public spirited and made it a rule to allow sufficient water to pass through their dams to keep the fish in good condition during the period of the minimum flow of water in the streams.

This work of the inspection and installing of "ladders" and screens will be most energetically pursued in the future, and I believe that another year will see satisfactory progress in this line.

EXPERIMENTS ON TRUCKEE RIVER.

Mr. F. A. Shebley and Mr. N. B. Scofield began a series of practical experiments on the Truckee River during the latter part of September, to determine if the refuse that passes into the river from the Crown Pulp and Paper Mill at Floriston is injurious to trout eggs and fry. The eggs and fry are being studied above and below the mill but the experiments have not yet been completed. A careful record is being kept of all the experiments, and so far the results of the experiments have been very conclusive. When the experiments are finished a full report of the results will be sent to your honorable Board.

RECOMMENDATIONS.

Besides the suggestions and recommendations that have already been made in this report, there are a few more that I deem it advisable to give at this time. They relate to the inauguration of a sea coast patrol boat, a southern California hatchery, discontinuance of planting eggs taken from the Sacramento River in other rivers, a general increase of hatchery work and a warning concerning the introduction of foreign fish.

SEA COAST PATROL BOAT.

On my trips of inspection in the southern coast counties, I interviewed a number of the more prominent fishermen, citizens interested in the preservation of the marine fishes, and the deputies in the seaboard counties, and from what I could learn regarding the condition from Monterey south, I am of the opinion that the Commission should have a motor boat for the sea coast patrol; a seaworthy boat that could stand the rough weather, so that the deputies could visit any of the islands from San Miguel Island south to Coronado Island. I believe that this is a very important measure for your honorable Board to consider, and I respectfully recommend that you give this your early and earnest consideration, so that the necessary recommendation can be made to the legislature for an appropriation to purchase a good seaworthy patrol motor boat to be used in the coast and island patrol.

SOUTHERN CALIFORNIA HATCHERY.

In my March report I recommended that the Commission investigate conditions in southern California, with a view to establishing a small hatchery in that end of the State. Pursuant to this recommendation, in company with Mr. E. W. Hunt, I made a trip in October through the southern California coast counties lying south of the Tehachapi Mountains. We examined a number of important sites and made a careful study of them to determine which was the best suited for the location of a hatchery to supply the southern California streams with trout fry. We found the San Antonio cañon in Los Angeles County to be the most favorable. At this site there is an abundance of pure water, free from algæ, organic matter, or any form of harmful bacteria or other deleterious matter. The site is just above the intake of the Sierra Power Company's pipe line in San Antonio cañon, on the south

basal slope of Mount San Antonio. From the end of the electric car line to the hatchery site is six and one half miles of good road, over which a team or auto truck can convey the fish to the cars without difficulty. We were informed that the State could secure the hatchery site and the water necessary to operate the hatchery at a nominal sum. A lease for at least twenty-five years or a water right or deed for 40 inches of water and two acres of land would be necessary. We shall endeavor to get an option on this site and a statement of the amount asked for the land and water rights. If the same can be had at a reasonable figure, I would respectfully recommend that an appropriation be asked of the next legislature for the purchase of the site or a lease of same, as well as for the construction of the hatchery, pipe line, dam, cottage, and for the purchase of an auto truck.

This proposition is an important one. The rapidly increasing population of the southern part of the State makes it necessary to distribute a greater number of fry in that section each year, and the most economical way of doing it is to establish a hatchery there.

INCREASE OF HATCHERY WORK.

With the rapidly increasing population of California, I believe that proportionate increase should be made in the hatchery work, so that a larger number of fish can be liberated each season to meet the demands of the increasing population. Several varieties of food and game fishes from the eastern states should be introduced, as I have recommended in my monthly reports to the Board.

DANGER IN INTRODUCTION OF PREDATORY FISH.

I wish to call the attention of your honorable Board and the legislature to the danger of allowing any of the more predatory fishes from the eastern waters to be introduced into this State. I would respectfully recommend that the legislature make it a misdemeanor for any person, company or corporation to introduce, carry, transplant, distribute, or ship into the State of California any live fish or fish eggs without first having obtained a permit in writing from the Board of Fish and Game Commissioners. A number of persons have recently asked the Commission for some of the more predatory fishes to be placed in the waters of our own State. They mean to be interested and progressive and do not realize the great damage that can be done by introducing undesirable species. In my opinion a strict law should be passed covering the subject so that no one will ever be allowed to introduce species that would be injurious and probably exterminate the valuable food fishes that we already have and are endeavoring to propagate in future.

WITHDRAWING SALMON EGGS FROM THE SACRAMENTO RIVER.

I mentioned in the report on the Price Creek Hatchery, that I believe sufficient eggs can be taken from Eel River and Mad River to stock those rivers. Heretofore these rivers have been stocked with eggs from the Sacramento River. I believe that this should not be continued and

I think that the Commission should recommend that the Federal Bureau discontinue this work. The Sacramento is far too important a river commercially to have its supply of salmon eggs depleted by transplanting to other streams.

Following the general increase of the hatchery work I would recommend that the propagation of striped bass be taken up again. In my opinion, if skilled fish culturists with modern apparatus take up this very important work, practical results can be obtained, and the numbers of this valuable food and game fish can be greatly increased. The legislature should appropriate a special fund for this work, as it is of great economic value to the people.

We now have several thousand grayling fry in our ponds at Sisson Hatchery that we are rearing for breeders. We hope to be able to get enough breeders from these fry to give us a start, so that we can collect and hatch the eggs of this gamey fish for our mountain lakes and streams.

One of the more important improvements in the hatchery work would be the construction of a new and modern hatchery at Tahoe City. The old hatchery was erected in 1889. The building is old and out of date and too small to accommodate the number of eggs and fry that must be handled at this station to obtain good results in stocking the numerous lakes and streams in the Tahoe district. I would respectfully recommend that a special appropriation for this purpose be made by the next legislature if they wish to keep up and increase the work at this important station.

CONCLUSION.

This concludes my brief report of the work done at each of the hatcheries and their numerous substations. Generally speaking I believe it has been the most progressive year in the history of the Commission, more productive of good results and replete with every assurance of just as good if not better prospects ahead.

In the beginning of this report I expressed my deep gratitude to the members of the Commission for their very generous coöperation and support. I thoroughly appreciate the assistance of my superiors, but I must not overlook those over whom I have had general supervision. They have given to the Commission the best service possible at all times, working night and day when necessary, each performing his work and filling his own particular duty to the best of his ability. The hearty coöperation of my superiors and the competent assistance of the employees of this department have made this year the fruitful, progressive year it has been.

Respectfully submitted.

W. H. SHEBLEY,
Superintendent of Hatcheries.

November 1, 1912.

PART II—STATISTICAL.

CALIFORNIA FISH AND GAME COMMISSION ADMINISTRATIVE DISTRICTS.

San Francisco District.

Alameda County.
Contra Costa County.
Del Norte County.
Humboldt County.
Lake County.
Marin County.
Mendocino County.
Monterey County.
San Benito County.
San Francisco County.
San Mateo County.
Santa Clara County.
Santa Cruz County.
Sonoma County.

Sacramento District.

Alpine County.
Amador County.
Butte County.
Calaveras County.
Colusa County.
El Dorado County.
Glenn County.
Lassen County.
Modoc County.
Napa County.
Nevada County.
Placer County.
Plumas County.
Sacramento County.
San Joaquin County.
Shasta County.
Sierra County.
Siskiyou County.
Solano County.
Sutter County.
Tehama County.
Trinity County.
Yuba County.
Yolo County.

Los Angeles District.

Imperial County.
Inyo County.
Los Angeles County.
Mono County.
Orange County.
Riverside County.
San Bernardino County.
San Diego County.
San Luis Obispo County.
Santa Barbara County.
Ventura County.

Fresno District.

Fresno County.
Kern County.
Kings County.
Madera County.
Mariposa County.
Merced County.
Stanislaus County.
Tuolumne County.
Tulare County.

BOARD OF FISH AND GAME COMMISSIONERS.

Roster, January 1, 1913.

Commissioners appointed by the Governor, by and with the consent of the Senate. Term at pleasure of the Governor. No pay.

Stats. 1869–70, p. 663; Pol. Code, Secs. 368, 642, 643.

F. M. Newbert, *President*, Sacramento.....Appointed Aug. 3, 1911
M. J. Connell, Los Angeles.....Appointed Feb. 1, 1909
Carl Westerfeld, San Francisco.....Appointed Nov. 28, 1911
Ernest Schaeffle, *Secretary*, San Francisco.....Appointed Nov. 29, 1911
J. S. Hunter.....Assistant in Charge Game Conservation
W. H. Shebley.....Superintendent of Hatcheries
J. H. Hoerl.....Clerk to Superintendent of Hatcheries
R. D. Duke.....Attorney

Head Office, San Francisco (734 Mills Building).

Under direction of Commissioner Carl Westerfeld.

Ernest Schaeffle.....Secretary
Arthur M. Fairfield.....Assistant Secretary
O. H. Reichling.....Cashier
Leo N. Pettit.....Record Clerk
H. R. Dunbar.....Clerk
E. McI. Rutter.....Clerk
Mae D. Horn.....Stenographer
M. O. Vreeland.....Stenographer

Los Angeles Office (510 Consolidated Realty Building).

Under direction of Commissioner M. J. Connell.

H. I. Pritchard.....Assistant
E. A. McKee.....Clerk and Stenographer

Fresno Office (347 Forsyth Building).

Under direction of Deputy A. D. Ferguson.

Lida H. Ransom.....Stenographer

Sacramento Office (Forum Building).

Under direction of Commissioner F. M. Newbert.

Geo. Neale.....Assistant
R. E. Cannel.....Clerk and Stenographer

List of Regular Deputies, San Francisco District.

Alameda County.

J. L. Bundock.....Oakland
Earle Downing.....Pleasanton
Amos O. Stinson.....Alameda

Del Norte County.

Paul Smith.....Requa

Humboldt County.

Earl P. Barnes.....Eureka
Theo. Benson.....Fortuna

Mendocino County.

Wm. Ray.....Laytonville
B. H. Miller.....Ukiah

Marin County.

Sheridan G. Smith.....Bolinas
Vernon D. Thomas.....San Rafael
Herbert E. Foster.....San Rafael

Monterey County.

Phil H. Over.....Pacific Grove
Frank Shook.....Salinas

Santa Cruz County.

J. H. Hill ..... Watsonville

Santa Clara County.

I. L. Koppel ..... San José

San Mateo County.

Frank H. Smith ..... Half Moon Bay

San Francisco County.

M. S. Clark ..... San Francisco
Ray B. Heacock ..... San Francisco

Sonoma County.

A. F. Lea ..... Cloverdale
Henry Lencioni ..... Santa Rosa

Patrol Launch "Quinnat."

H. B. Nidever, Captain ..... Headquarters, Vallejo
J. Christenson, Engineer ..... Headquarters, Vallejo

Los Angeles District.

Inyo County.

E. H. Ober ..... Bishop

Orange County.

F. A. Forster ..... Capistrano

Riverside County.

Jas. H. Gyger ..... Perris

Los Angeles County.

I. A. Bordner ..... Long Beach

Santa Barbara County.

H. J. Abels ..... Santa Maria

San Bernardino County.

Jas. A. Vale ..... San Bernardino

San Diego County.

Webb Toms ..... San Diego

Ventura County.

Jas. A. Rasmussen ..... Ventura

Fresno District.

Kern County.

Tipton Mathews ..... Wasco

Fresno County.

S. L. N. Ellis ..... Fresno
F. A. Bullard ..... Dunlap

Stanislaus County.

J. E. Newsome ..... Newman
R. E. Shepherd ..... Merced

Tulare County.

E. W. Smalley ..... Hanford
D. H. Hoen ..... Visalia

Tuolumne County.

W. G. Scott ..... Soulsbyville

Sacramento District.

Amador County.

Fred Werner ..... Sutter Creek

Calaveras County.

David E. Roberts ..... Murphys

Colusa County.

S. J. Carpenter ..... Maxwell

El Dorado County.

Euell Gray ..... Shingle

Lassen County.

Frank P. Cady ..... Susanville

Napa County.

Wm. J. Moore ..... Napa

Modoc County.

John Todd Bonner ..... Alturas
Geo. W. Courtwright ..... Straw

Nevada County.

R. C. O'Connor ..... Grass Valley

Placer County.

S. J. Mandeville ..... Truckee
C. A. Scroggs ..... Loomis

Plumas County.

Geo. W. Chamberlin ..... Quincy

Sacramento County.

Wm. J. Green ..... Sacramento
C. H. Blemer ..... Sacramento

Siskiyou County.

Frank S. Parke ..... Yreka

Solano County.

Wm. H. Armstrong ..... Vallejo

San Joaquin County.

Richard Squire ..... Lodi
George J. Merritt ..... Stockton

Shasta County.

J. S. White ..... Castella

Trinity County.

G. O. Laws ..... Weaverville

Tehama County.

T. W. Birmington ..... Red Bluff

Yolo County.

R. L. Sinkey ..... Woodland
E. E. Wilgus ..... Winters

Special Investigators, Game Farm and Hatchery Employees.

Special Investigators.

Harold Heath (Mollusks) ..... Stanford University
N. B. Scofield (Salmon and Fishery Methods) ..... Sunnyvale
F. W. Weymouth (Crabs) ..... Stanford University
Willard E. Kay (Crabs) ..... Stanford University
H. C. Bryant (Game and Non-Game Birds) ..... University of California
Chas. L. Edwards (Abalone) ..... Los Angeles
Gretchen L. Libby, Educational Assistant ..... Riverside
Frank C. Clarke (Deer and Other Game Animals) ..... University of California
R. W. Requa, Assistant in Fishway and Screen Work ..... Sisson
A. E. Doney, Assistant in Fishway and Screen Work ..... Sisson
Chas. L. Gilmore, In Charge Stream Survey ..... Sacramento

Hayward Game Farm.

W. N. Dirks ..... Superintendent
David Fontes ..... Assistant

Fish Hatchery Employees.

Sisson Hatchery.

E. W. Hunt ..... Superintendent
F. McCrea ..... Foreman
E. V. Cassell ..... Assistant
C. Nixon ..... Inside Foreman
F. Sullaway ..... Outside Foreman
F. Clessens ..... Assistant
J. McManus ..... Assistant
Geo. McCloud, Jr. ..... Assistant
E. Clessens ..... Assistant
J. E. Winchcomb ..... Assistant
R. I. Bassler ..... Assistant
Wm. Hefferman ..... Assistant

Brookdale Hatchery.

F. A. Shebley ..... Superintendent
H. L. Nelf ..... Assistant

Swanton Egg Collecting Station, Scott Creek.

W. H. Rich ..... Deputy in Charge

Grizzly Bluff Hatchery, Eel River.

W. O. Fassett ..... Superintendent
N. F. Sisson ..... Assistant

Sacramento Experimental Salmon Station.

M. L. Cross ..... Superintendent
Geo. A. West ..... Assistant
Wm. Rogers ..... Assistant

INVENTORY OF STATE PROPERTY IN CHARGE OF FISH AND GAME COMMISSION.

Recapitulation Statement, June 30, 1912.

Office equipment, San Francisco	$2,204 05	
Office equipment, Sacramento	609 60	
Office equipment, Fresno	594 50	
Office equipment, Los Angeles	579 60	
		$3,987 75
Hatcheries.		
Sisson Hatchery, including fish distribution car and equipment, cottage at Sisson, Shasta River Station, Shovel Creek Station, Bogus Creek Station, Camp Creek, material at Terry and at Thrall	$41,264 35	
Tahoe Hatchery	4,768 70	
Tallac Hatchery and cottage	4,823 10	
Tallac Spawning Station, cottage and cabin	680 79	
Glen Alpine Hatchery	36 05	
Scott Creek (Santa Cruz County)	1,218 80	
Price Creek Hatchery (Humboldt County)	2,840 55	
Sacramento Experimental Station	580 49	
Wawona Hatchery	86 00	
Ukiah Hatchery	83 65	
Bouldin Island Hatchery (stored, South End Warehouse)	125 00	
		56,507 48
Launches.		
"Quinnat" and equipment	$5,712 90	
"Shad" and equipment	1,174 60	
"Audubon" and equipment	740 75	
		7,628 25
State Game Farm.		
Equipment, cottage and tank house	$9,251 94	
Game birds and animals	2,242 63	
		11,494 57
Miscellaneous.		
State property in charge of Commission employees		1,658 79
Collecting nets stored at Vallejo		126 00
Total		$81,402 84

REVENUES AND EXPENDITURES.

The following financial statement shows concisely and fully the sources and amounts of the funds coming into the Board's control since the filing of the last biennial report, with the channels and amounts of expenditures:

Balance on hand June 30, 1910		$73,318 21
Receipts.		
Sale of hunting licenses, 1910–1911	$143,265 00	
Sale of hunting licenses, 1911–1912	146,181 00	
		$289,446 00
Sale of commercial fishing licenses, 1910–1911	$23,595 00	
Sale of commercial fishing licenses, 1911–1912	23,545 00	
		47,140 00
Sale of wholesale fish and game dealers' licenses, 1911–1912		1,265 00
Fines paid into state treasury for violations of fish and game laws, 1910–1911	$15,941 30	
Fines paid into state treasury for violations of fish and game laws, 1911–1912	19,530 13	
		35,471 43
Sale of game and produce from Game Farm		2,097 80
Total		$375,422 23

Disbursements, Year 1910-1911.

San Francisco District—Salaries, traveling expenses, rentals, etc.	$86,803 60
Los Angeles District—Salaries, traveling expenses, rentals, etc.	16,407 40
Fresno District—Salaries, traveling expenses, rentals, etc.	14,145 85
Game Farm—Salaries, expenses, supplies, purchase of birds, etc.	10,805 64
Hatcheries and spawning stations—Salaries, traveling expenses, supplies	30,611 32
Distribution of fish (by car)—Salaries, expenses, supplies, etc.	4,802 61
Fish patrol (launches)—Salaries, expenses, supplies, etc.	12,811 02
Scientific investigations and publicity relating thereto—Salaries, expenses, supplies, etc.	5,814 58
Prosecutions and fees	7,492 35
Commissions on sale of hunting licenses and refunds	12,586 43
Bounties on California lions	5,420 00
Total	$207,770 80

NOTE.—During the year 1910–11 the San Francisco District included the counties now forming the Sacramento District.

Disbursements, 1911-1912.

San Francisco District—Salaries, traveling expenses, rentals, etc.	$49,885 54
Sacramento District—Salaries, traveling expenses, rentals, etc.	35,700 39
Los Angeles District—Salaries, traveling expenses, rentals, etc.	18,555 38
Fresno District—Salaries traveling expenses, rentals, etc.	21,390 68
Game Farm—Salaries, expenses, supplies, purchase of birds, etc.	8,228 84
Hatcheries and spawning stations—Salaries, traveling expenses, supplies, etc.	40,998 09
Distribution of fish (by car)—Salaries, expenses, supplies, etc.	5,561 58
Fish patrol (launches)—Salaries, expenses, supplies, etc.	6,046 01
Scientific investigations and publicity relating thereto—Salaries, expenses, supplies, etc.	8,806 65
Prosecutions and fees	9,245 37
Commissions on sale of hunting and fishing licenses and refunds	13,161 40
Bounties on California lions	5,680 00
Miscellaneous charges	6,910 46
Total	$230,170 39
June 30, 1912, balance in state treasury, after June bills were paid	32,634 68

(It is impossible to reconcile statement of license sales and other revenues for any year with statement of payments into and balances of state treasury, as collections are not all made during same fiscal year.)

It should be explained that an appropriation of $20,000.00 yearly for the support and maintenance of hatcheries, which was available up to June 30, 1910, has not been received since that time. In consequence of this loss, the fish cultural work of the Board has been seriously interfered with and will be more greatly impeded and injured within the next two years if the appropriation is not restored and in increased amount.

As the foregoing statement shows, the Board's receipts from all direct fishery sources—that is, from the sale of commercial fishing licenses and fines for the violation of fish laws—amounts to only $60,000.00 in round numbers for the biennial term. This amount is entirely insufficient to maintain the fish work of the State on a proper plane and can not properly be increased by diversions from the revenues derived from game and hunting sources.

According to Dr. T. S. Palmer, assistant chief of the U. S. Biological Survey, a Californian and recognized by competent authorities as being one of the foremost game conservationists of the world, this State presents a problem that is not faced by the fish and game commissions of any other state. The problem is unusual and great, not merely because of the great area and length of the State, with attendant geographical and climatic variations, but because of the numbers of species and extensive ranges of some of the most important members.

SEIZURES OF FISH, GAME AND ILLEGALLY USED FISHING APPARATUS.
July 1, 1910, to June 30, 1912.

	San Francisco district.	Sacramento district.	Los Angeles district.	Fresno district.	Total.
Illegally used fishing apparatus (nets and lines)	47	82		33	162
Salmon	146 lbs.			12 lbs.	158 lbs.
Striped bass	2,086 lbs.	355 lbs.			2,441 lbs.
Steelhead	671 lbs.				671 lbs.
Black bass		20 lbs.		139 lbs.	159 lbs.
Catfish	50 lbs.	333 lbs.		1,525 lbs.	1,908 lbs.
Trout	525 lbs.	100 lbs.		16 lbs.	641 lbs.
Crawfish	25 lbs.	40 lbs.	10 lbs.		75 lbs.
Crabs	1,774	135		60	1,969
Dried shrimp	586 lbs.				586 lbs.
Abalones		50	14 16 sacks 24½ sacks*		64 16 sacks 24½ sacks*
Clams	390				390
Miscellaneous fish	356 lbs.	20 lbs.	3,500 lbs.		3,876 lbs.
Deer meat	502 lbs.	399 lbs.	145 lbs.	130 lbs.	1,176 lbs.
Deer hides	47	3			50
Ducks	5,822		786	350	6,958
Quail	508		30	1	539
Doves	20			11	31
Plover, rail, snipe, etc.	105				105
Non-game birds	561			5	566
Pheasants				2 live	2 live
Tree squirrels	60				60
Rabbits	583	9	57	31	680

Illegally used fishing apparatus, after condemnation in superior courts, is destroyed by the Board; all wholesome fish and game is donated to public and charitable institutions, from whom many grateful letters of acknowledgment have been received.

NOTE.—Complete and accurate record of *seizures* kept and reported only since April, 1912.

*Sacks of shells.

RECAPITULATION.

Arrests—			
Fish cases		748	
Game cases		1,315	
Total			2,063
Convictions—			
Fish cases	505		
Game cases	1,116		
		1,621	
Acquittals and dismissals—			
Fish cases	200		
Game cases	193		
		393	
Pending cases—			
Fish cases	43		
Game cases	6		
		49	
Total			2,063
Fines imposed—			
Fish cases		$12,725 00	
Game cases		23,993 50	
Total		$36,718 50	
Fines paid into courts—			
Fish cases		$11,415 00	
Game cases		23,109 00	
Total		$34,524 00	

HUNTING LICENSES ISSUED—FISH AND GAME COMMISSION AND COUNTIES.

Counties.	Fiscal year 1910-1911.				Fiscal year 1911-1912.			
	At $1.00.	At $10.00.	At $25.00.	Total.	At $1.00.	At $10.00.	At $25.00.	Total.
Alameda	$6,946 00		$125 00	$7,071 00	$7,173 00		$100 00	$7,273 00
Alpine	50 00	$20 00		70 00	59 00	$50 00		109 00
Amador	992 00	10 00		1,002 00	950 00			950 00
Butte	2,731 00			2,731 00	2,878 00			2,878 00
Calaveras	829 00			829 00	1,116 00			1,116 00
Colusa	1,707 00	40 00		1,747 00	1,668 00	20 00		1,688 00
Contra Costa	1,474 00			1,474 00	1,610 00		50 00	1,660 00
Del Norte	322 00			322 00	292 00			292 00
El Dorado	955 00			955 00	1,001 00		25 00	1,026 00
Fresno	5,302 00	10 00	200 00	5,512 00	5,846 00	10 00	100 00	5,956 00
Fresno office	62 00			62 00	374 00			374 00
Glenn	977 00		50 00	1,027 00	1,102 00			1,102 00
Humboldt	3,452 00	10 00	100 00	3,652 00	3,296 00	30 00	125 00	3,451 00
Imperial	405 00			405 00	366 00			366 00
Inyo	930 00	80 00		1,010 00	915 00	10 00	25 00	950 00
Kern	4,649 00	10 00	75 00	4,734 00	4,964 00		75 00	5,039 00
Kings	1,342 00	10 00		1,352 00	1,246 00			1,246 00
Lake	1,194 00			1,194 00	1,218 00		25 00	1,243 00
Lassen	541 00	10 00		551 00	618 00	20 00		638 00
Los Angeles	15,028 00	120 00	150 00	15,298 00	12,886 00	100 00	150 00	13,136 00
Los Angeles office	2,931 00	110 00	125 00	3,166 00	4,892 00	40 00	50 00	4,982 00
Madera	727 00			727 00	764 00	10 00	25 00	790 00
Marin	856 00		125 00	981 00	608 00			608 00
Mariposa	300 00			300 00	341 00			341 00
Mendocino	1,680 00	10 00	125 00	1,815 00	2,235 00	10 00	250 00	2,495 00
Merced	1,704 00	10 00	75 00	1,789 00	1,753 00		175 00	1,928 00
Modoc	496 00	10 00		506 00	599 00			599 00
Mono	197 00	60 00		257 00	232 00	60 00		292 00
Monterey	2,217 00	20 00	50 00	2,287 00	2,046 00	10 00	25 00	2,081 00
Napa	1,840 00		150 00	1,990 00	1,881 00		125 00	2,006 00
Nevada	1,624 00			1,624 00	1,640 00		25 00	1,665 00
Orange	2,351 00			2,351 00	2,363 00			2,363 00
Placer	1,779 00		100 00	1,879 00	1,900 00		100 00	2,000 00
Plumas	515 00	30 00		545 00	493 00		25 00	518 00
Riverside	3,101 00	20 00	150 00	3,271 00	2,886 00	20 00	50 00	2,956 00
Sacramento	3,925 00	10 00	100 00	4,035 00	4,517 00	20 00	200 00	4,737 00
San Benito	996 00	10 00		1,006 00	1,045 00		75 00	1,120 00
San Bernardino	3,675 00			3,675 00	3,488 00	10 00		3,498 00

San Diego	3,493 00	20 00		3,513 00	3,631 00	20 00		3,651 00
San Francisco	760 00		125 00	885 00				
San Francisco office	13,588 00	150 00	1,100 00	14,838 00	13,038 00	70 00	1,125 00	14,233 00
San Joaquin	3,377 00		25 00	3,402 00	3,579 00		50 00	3,629 00
San Luis Obispo	1,444 00	10 00	50 00	1,504 00	1,368 00		25 00	1,393 00
San Mateo	1,720 00	20 00	25 00	1,765 00	1,623 00		75 00	1,698 00
Santa Barbara	1,644 00	40 00	75 00	1,759 00	1,800 00	50 00	50 00	1,900 00
Santa Clara	4,177 00	10 00	25 00	4,212 00	4,545 00		50 00	4,595 00
Santa Cruz	1,934 00		25 00	1,959 00	2,310 00	10 00	25 00	2,345 00
Shasta	2,240 00	20 00		2,260 00	1,935 00	10 00		1,945 00
Sierra	148 00			148 00	167 00			167 00
Siskiyou	3,126 00	70 00	75 00	3,271 00	3,218 00	30 00	125 00	3,373 00
Solano	1,917 00		175 00	2,092 00	2,315 00	10 00	150 00	2,475 00
Sonoma	4,734 00		225 00	4,959 00	5,455 00		275 00	5,730 00
Stanislaus	1,674 00		25 00	1,699 00	1,546 00	10 00		1,556 00
Sutter	860 00	20 00	25 00	905 00	873 00		25 00	898 00
Tehama	1,302 00	40 00		1,342 00	1,243 00			1,243 00
Trinity	793 00			793 00	668 00		25 00	693 00
Tulare	2,760 00	10 00		2,770 00	3,065 00	10 00		3,075 00
Tuolumne	1,052 00	10 00		1,062 00	1,069 00		25 00	1,094 00
Ventura	1,864 00	10 00	75 00	1,949 00	1,792 00	40 00	25 00	1,857 00
Yolo	1,644 00	30 00	25 00	1,699 00	1,856 00		100 00	1,956 00
Yuba	1,267 00	10 00		1,277 00	1,194 00			1,194 00
Totals	$138,410 00	$1,080 00	$3,775 00	$143,265 00	$141,551 00	$680 00	$3,950 00	$146,181 00

Total number licenses issued 1910 1911 138,669

Total number licenses issued 1911 1912 141,777

COMMERCIAL FISHING LICENSES ISSUED.

April 1, 1910, to March 31, 1911—

Alien	$19,140 00
Citizen	4,455 00
Total	$23,595 00

April 1, 1911, to March 31, 1912—

Name of district.	Alien.	Citizen.	Total.
Lower Sacramento	$650 00	$462 50	$1,112 50
Upper Sacramento	10 00	287 50	297 50
Southern California coast	3,730 00	1,117 50	4,847 50
Bay district	800 00	67 50	867 50
Bay district	620 00	45 00	665 00
Tomales Bay district	180 00	110 00	290 00
Bay district	5,130 00	377 50	5,507 50
Bay district	620 00	20 00	640 00
Tahoe district	10 00	237 50	247 50
Monterey district	1,180 00	132 50	1,312 50
Humboldt district	260 00	102 50	362 50
Del Norte district	520 00	375 00	895 00
Bay district	390 00	12 50	402 50
San Joaquin district	20 00	15 00	35 00
Humboldt district	380 00	457 50	837 50
Humboldt district		7 50	7 50
San Joaquin district	10 00	7 50	17 50
Upper Sacramento district		12 50	12 50
All districts	4,135 00	1,052 50	5,187 50
Totals	$18,645 00	$4,902 50	$23,545 00

STATEMENT OF LION BOUNTIES PAID BY FISH AND GAME COMMISSION FROM OCTOBER, 1907, TO JANUARY 1, 1913.

Counties.	1907.	1908.	1909.	1910.	1911.	1912.	Total.
Alameda		1					1
Amador		3		1	2	2	8
Butte	2	11	5	2	4	3	27
Calaveras		1	4	1		1	7
Colusa		3		3	3	1	10
Del Norte		10	12	4	11	11	48
El Dorado	2	7	2	1	8	9	29
Fresno		1	3	1		4	9
Glenn		13	6	6	1	4	30
Humboldt	10	113	67	71	42	50	353
Inyo						1	1
Kern		8	10	12	5	9	44
Lake	2	14	11	13	9	10	59
Lassen			1		2	1	4
Los Angeles		7	1	2	2		12
Madera		3	5	1		1	10
Mariposa	2	4	3	6	2	1	18
Mendocino	5	44	18	11	16	17	111
Merced				1			1
Modoc			1	1	1		3
Monterey		14	11	7	1	3	36
Napa				1		2	3
Nevada		1	1	1			3
Orange			1	1	1		3
Placer		5	4	1	2	7	19
Plumas		2		3		1	6
Riverside		2	5			4	11
San Benito		1	2	1	2	11	17
San Bernardino		5	2	1	2		10
San Diego		3	5	5	8	3	24
San Luis Obispo		11	5	9	4	4	33
San Mateo				1			1
Santa Barbara		7	24	7	3	5	46
Santa Clara			4			1	5
Santa Cruz				1			1
Shasta	1	25	32	31	29	28	146
Sierra		1				3	4
Siskiyou	1	31	35	45	25	25	162
Sonoma			2	4	1	4	11
Stanislaus			2		1		3
Sutter						1	1
Tehama	3	31	19	25	10	22	110
Trinity	9	86	34	32	22	15	198
Tulare		6	8	11	4	5	34
Tuolumne		6	10	5	2	4	27
Ventura		1	6	4	6	2	19
Yuba		1			2		3
Totals	37	482	361	333	233	275	1,721

STATE GAME FARM, HAYWARDS.

Distribution of game birds, 1911.

	Pheasants.	Wild Turkeys.	Partridges.	Quail.
Sold for breeding purposes	200	33	----------	----------
Given away for breeding and exhibition purposes	88	----------	----------	22
Released	100	400	44	----------
Eggs given away for breeding and exhibition purposes	358	----------	----------	60

STATE GAME FARM, HAYWARDS.

Distribution of game birds, 1912.

Alameda County.

Date.	Applicant.	Address.	Pheasants.	Wild Turkeys.	Quail.
1912.					
Mar. 20	Fish and Game Com.	Livermore	----------	28[1]	----------
Mar. 21	C. A. Kofoid	U. C., Berkeley	----------	1[2]	----------
Mar. 25	Fish and Game Com.	Sunol	----------	14[1]	----------
Mar. 25	Fish and Game Com.	Livermore	----------	13[1]	----------
Jan. 14	H. C. Cutting	San Lorenzo	5[3]	----------	----------
Jan. 15	Mrs. Mathiassen	San Lorenzo	60[3]	----------	----------
Jan. 21	Mr. Childs	Oakland	2[3]	----------	----------
Feb. 4	H. C. Cutting	San Lorenzo	4[3]	----------	----------
Mar. 19	County Infirmary	——— ———	1[3]	----------	----------
Apr. 20	Dr. Harvey Baker	Berkeley	----------	1[2]	----------
May 7	Mrs. Millette	Hayward	----------	----------	1[3]
May 7	Mrs. Millette	Hayward	----------	----------	1[3]
May 17	E. K. Strowbridge	Hayward	12 eggs[2]	----------	----------
May 24	F. Russell	Alameda	14 eggs[2]	----------	----------
June 7	J. W. Marvin	Livermore	50 eggs[2]	----------	----------
Aug. 10	C. J. Smith	Oakland	2[2]	----------	----------
Sept. 16	C. L. Crellin	Pleasanton	50[1]	----------	----------

Del Norte County.

Sept. 25	Paul Smith	Requa	100[1]	----------	----------

Fresno County.

Feb. 22	A. V. Lisenby	Fresno	3[4]	----------	----------
Mar. 1	Fish and Game Com.	Sanger	40[1]	----------	----------
Sept. 2	Fish and Game Com.	Sanger	100[1]	----------	----------
Sept. 23	Fish and Game Com.	Dunlap	60[1]	----------	----------

Humboldt County.

Aug. 24	Earl P. Barnes	Eureka	100[1]	----------	----------
Aug. 24	Earl P. Barnes	Eureka	----------	50[1]	----------

Lassen County.

Sept. 4	Frank P. Cady	Susanville	100[1]	----------	----------
Sept. 21	Geo. Wingfield	Jamesville	----------	----------	50[1]

STATE GAME FARM, HAYWARDS.

Distribution of Game Birds, 1913—Continued.

Mendocino County.

Date.	Applicant.	Address.	Pheasants.	Wild Turkeys.	Quail.
Mar. 5	Capt. Neilsen	Willits	3[3]		
Sept. 13	B. H. Miller	Ukiah	50[1]		

Monterey County

May 24	Frank Shook	Salinas		2[1]	
Aug. 12	Phil Oyer	Pacific Grove	100[1]		

Napa County.

Sept. 13	W. J. Moore	Napa	50[1]		
Sept. 18	John McCormick	St. Helena	50[1]		

Nevada County.

Feb. 12	T. F. Hogan	Grass Valley	2[4]		
Sept. 18	Dr. I. W. Hays	Grass Valley		30[1]	

Placer County.

Sept. 5	Montgomery Godley	Lincoln		25[1]	

Sacramento County.

Jan. 24	Fish and Game Com.	Folsom		20[1]	
Oct. 7	Geo. G. Laeke	Walnut Grove	50[1]		

San Benito County.

Feb. 13	Fish and Game Com.	Tres Pinos		25[1]	
Aug. 20	J. H. Hill	Watsonville		50[1]	
Sept. 9	J. Lee Jones	Tres Pinos	100[1]		

San Francisco County.

Mar. 18	U. S. Marine Hospital	San Francisco		1[2]	
Mar. 19	Golden Gate Park	San Francisco	2[3]		
Sept. 18	Capt. C. A. Gove	Yerba Buena Isl.	25[1]		

San Mateo County.

Jan. 22	J. B. Leonard	Menlo Park	12[3]		
Apr. 2	J. B. Leonard	Menlo Park	1[3]		

Santa Clara County.

Jan. 25	R. W. Withey	Los Gatos	3[3]		
Feb. 12	F. S. Daniels	Mountain View		1[4]	
Mar. 18	R. W. Withey	Los Gatos			4[3]

STATE GAME FARM, HAYWARDS.

Distribution of Game Birds, 1912—Continued.

Santa Cruz County.

Date.	Applicant.	Address.	Pheasants.	Wild Turkeys.	Quail.
Aug. 13	Geo. Martin and H. C. Peckham.	Watsonville	50[1]		

Shasta County.

Oct. 4	B. C. McCray	Redding		32[1]	

Solano County.

Aug. 27	John Hollenbeck	Ryer Island	100[1]		

Sonoma County.

Feb. 5	Thompson Bros.	Petaluma	3[3]		
Sept. 15	F. M. Child	Cazadero		25[1]	

Stanislaus County.

Aug. 14	Geo. Prowse	Oakdale			1[2]

Sutter County.

Feb. 15	Mrs. D. W. Chilson	Pleasant Grove	1[4]		

Tehama County.

Jan. 17	C. C. Barrows	Corning	4[4]		

Tuolumne County.

Jan. 23	Fish and Game Com.	Tuolumne		50[1]	

Tulare County.

Sept. 2	J. D. Blick	Three Rivers	50[1]		
Sept. 2	Tom Jacobs	Visalia	25[1]		
Sept. 2	Porterville Game Protective Association.	Porterville	50[1]		
Sept. 23	Deer Creek Fish and Game Protective Association.	Hot Springs	40[1]		
	Totals		1,398 76 eggs	368	57

[1]Released.
[2]Given for experiment.
[3]Exchange for other birds.
[4]Sold.

HATCHERIES.

Fish Distribution (Partial), Season 1911.

(Note.—Because of the loss of records during the absence from his office of Superintendent W. H. Shebley in 1911, only a partial statement of that season's distribution can be given.) (Secretary.)

Counties.	Black bass.	Rainbow trout.	Eastern brook trout.	Loch Leven trout.	Black-spotted trout.	Steelhead trout.
Alameda		10,000				345,000
Amador		16,000		6,000		
Butte		74,000	18,000	9,000		
Calaveras		72,000				
Contra Costa						8,000
Colusa		40,000	8,000			8,000
El Dorado		117,000	60,500	35,500	1,636,305	
Fresno		12,000		36,000		6,000
Inyo		60,000	37,000	43,000		
Kern	700	30,000		6,000		
Lake		24,000				68,000
Lassen		44,000	16,000	4,000		
Los Angeles	50	79,500				
Marin						65,000
Mariposa		54,000	20,000	50,000		
Mendocino						283,000
Modoc		48,000	20,000	14,000		
Mono		42,000	36,000	38,000		
Monterey		46,000				
Napa		52,000				44,000
Nevada		108,000	61,000	95,000		215,000
Orange	775	15,000				
Placer		174,100	113,000	50,500	758,446	
Plumas		75,000	40,500	126,000		
Riverside	*1,130					
Sacramento						250,000
San Benito		36,000				4,000
San Bernardino	*630	540,000				
San Diego		18,000				
San Mateo		32,000				434,000
Santa Barbara		36,000				
Santa Clara		64,000	2,000			110,000
Shasta		331,000		8,000		
Sierra		16,000	6,000		335,000	
Siskiyou		174,000	17,500	35,500		
Solano		10,000		10,000		12,000
Sonoma		20,000				
Tehama		96,000	4,000	4,000		
Trinity		22,000		12,800		
Tulare		100,000	20,000	250		6,100
Tuolumne		78,000	18,000	24,000		
Ventura		33,000				
Yuba		12,000				
Totals	3,285	2,810,600	497,500	607,550	2,729,751	1,858,100

*Adult.

SISSON HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF LOCH LEVEN TROUT.

Applicant.	Number.	Waters stocked.	Month of delivery.
R. Belden	3,000	Indian and Yellow creeks, Plumas County	May
H. C. Chamberlain and others.	18,000	Homer Lake, Long Valley reservoir, and Wolf Creek, Plumas County.	May
W. C. Robinson	18,000	Bear, Buck, Mill, Big, Clear, Rock, Silver and Grizzly creeks, Plumas County.	May
M. H. Bernheim	12,000	Eureka, Grass, Jamison and Rock lakes and Jamison Creek, Plumas County.	May
Portola Improvement Association.	9,000	Willow, Humbug and Grizzly creeks, Plumas County.	May
Smith & Weil	6,000	Mill Creek and Three Lakes, Plumas County	May
Taylorsville Gun Club	12,000	Lights, Cooks, Indian and Grizzly creeks, Plumas County.	May
Quincy Gun Club	18,000	Spanish, Rock, Mill, Clear, Greenhorn, Taylor creeks and Middle Fork Feather River, Plumas County.	May
C. N. Johnston	12,000	Feather River and Smith Creek, Plumas County.	May
G. F. Edwards	12,000	Tributaries of Feather River, Plumas County	May
A. Machomich	6,000	Feather River, Sulphur and Willow creeks, Plumas County.	May
F. M. Rutherford	15,000	Truckee River, Schaffer and Alder creeks, Nevada County.	May
N. A. Hawkins	18,000	Shasta River, Siskiyou County	May
North Fork Game Protective Association.	12,000	Willow Creek, Placer County	May
J. B. Knapp	6,000	Canyon Creek and North Fork American River, Placer County.	June
Lake Tahoe Railway and Transportation Co.	18,000	Blackwood Creek and Truckee River, Placer County.	June
Nevada City Hunting and Fishing Club.	21,000	Deer and Rock creeks and Woods Ravine, Nevada County.	June
L. Y. Coggins	9,000	Dobkins Lake and North Fork Eddy Creek, Siskiyou County.	June
E. Meybem	12,000	Butte Creek, Butte County	June
Fred Werner	12,000	Sutter Creek, Amador County	June
City of Vallejo	30,000	Lake No. 2 and creek between Dam No. 1 and Dam No. 2, Solano County.	June
Fresno Division, Fish and Game Commission.	36,000	Tamarack, Maxwell, Log Cabin, Two Mile, Pingley and Red Can lakes, Tuolumne County.	July
Geo. F. Conlin	12,000	South Fork Stanislaus River, Tuolumne County.	July
R. B. Shaw and H. M. De Ferrari.	24,000	North and Middle forks Tuolumne River, Tuolumne County.	July
J. O. Bigelow	24,000	Basin Creek, Tuolumne County	July
D. E. Roberts	12,000	North Fork Stanislaus River and Beaver, San Antone and O'Neal creeks, Calaveras County.	July
H. M. Freeman	36,000	Three Loch Leven lakes, Placer County	July
Miss Katherine Chandler	12,000	Five Lakes and Bear and Squaw creeks, Placer County.	July
Al Tahoe Company	6,000	Trout and Cold creeks, El Dorado County	July
H. E. Cagwin	9,000	Upper and Lower Echo lakes, El Dorado County.	July
Santa Clara Fish and Game Protective Association.	24,000	Planted in the streams of Santa Clara County	July
G. F. Edwards	18,000	Gold Lake, Plumas County	July
H. L. Beecroft	6,000	Grizzly Creek and Ice Lake, Plumas County	July
Frank P. Cady	7,500	Susan River and Silver and Caribou lakes, Lassen County.	July
Geo. D. Campbell	2,500	East Creek, Modoc County	July
L. H. Sisson	2,500	South Fork Mill Creek, Modoc County	July
Ira Hansen	2,500	Parker Creek, Modoc County	July

SISSON HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF LOCH LEVEN TROUT—*Continued.*

Applicant.	Number.	Waters stocked.	Month of delivery.
Sisson Promotion Association.	18,000	Sullaway, Big Spring Creek and North Fork of Sacramento River, Siskiyou County.	July
Geo. Neale	6,000	Battle Creek, Tehama County	July
Fresno Division, Fish and Game Commission.	36,000	Barren Lakes of High Sierra, Madera County	July
W. P. Yaney	9,000	Longley, Horton, Birch creeks and Middle and South Forks of Bishop Creek, Inyo County.	July
A. L. Stewart	3,000	Wyman and Crooked creeks, Inyo County	July
Hall & McAfee	27,000	Baker, Big Pine, Little Pine, Birch and Tinnemaha creeks, Big Pine Lakes and Red Mountain Lakes, Inyo County.	July
A. Davies	9,000	Little Truckee River, Nevada County	August
A. Papa	18,000	South Yuba River, Placer County	August
J. S. Cain	6,000	Walker River, Mono County	August
A. G. McFarland	6,000	South Fork Yuba River, Placer County	August
Webber Lake Club	18,000	Tributary to Webber Lake, Nevada County	August
G. F. Zentgraff	12,000	Pilot and Bear creeks, El Dorado County	August
J. M. Amick	6,000	Mokelumne and Bear rivers and South Fork Cosumnes River, Amador County.	August
G. S. Wilson	12,000	Indian, Reddings, Browns, East Weaver and Rush creeks, Trinity County.	August
W. E. Tebbe	12,000	Island Lake, Siskiyou County	August
Geo. E. King	15,000	Woodruth and Rock creeks and North, East and South Forks Yuba River, Sierra County.	September
R. Colwell	5,000	Rubicon River and Rock Bound Lake, El Dorado County.	September
Jas. Bryson	12,500	Echo and Adrian lakes and American River, El Dorado County.	September
Glen Alpine Springs Company.	6,000	Glen Alpine Creek and Grass, Susie and Heather lakes, El Dorado County.	September
Mayo A. Greenlaw	9,000	Echo Lake, El Dorado County	September
W. W. Price	15,000	Witches' Cave and Floating Island, Cathedral, Upper and Lower Angora lakes and Glen Alpine Creek, El Dorado County.	September
Grass Valley Sportsmen's Club.	17,500	Clipper, Wolf, Rattlesnake, Dry, Squirrel, Nigger and Slate creeks, Nevada County.	September
Murphy Bros. and Morgan.	12,500	Bear, Hawk, Richardson and Granite lakes, El Dorado County.	September
Lawrence & Comstock	9,000	Floating Island and Angora lakes, El Dorado County.	September
Bert Berry	7,500	Poro Creek, Tulare County	September
Shaver Lake Fishing Club	35,000	Shaver Lake, Fresno County	September
Deer Creek Fish and Game Protective Association.	5,000	North and South Deer creeks, Tulare County	September
T. A. Chatten	7,500	Eagle Creek, Kaweah Creek and Franklin Lake, Tulare County.	September
W. A. Sperry	5,000	Grizzly Creek and Clover Valley, Plumas County.	September
Robert Belden	9,000	Entire shipment lost because of lack of care	September
Euell Gray	15,000	Cody, Right, Doik, Blood, Succor, Echo and Adrian lakes and American River, El Dorado County.	September
Dr. C. S. Noble and others.	5,000	Lopez, Arroyo Grande and Tar Spring creeks, San Luis Obispo County.	September
A. D. Shepard	20,000	Castle Lake, Siskiyou County	September
Pacific Gas and Electric Company.	30,000	Lakes Spaulding and Fordyce, Placer County	September
Yosemite Valley Railway Company.	60,000	Merced River, Merced County	September
Major Wm. W. Forsyth	20,000	Merced River, Mariposa County	September

SISSON HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF LOCH LEVEN TROUT—*Continued.*

Applicant.	Number.	Waters stocked.	Month of delivery.
Jas. A. Vale	50,000	Lytle, Devoir, Cable, City, Plunge, Bear, Mill, Salfrit, Creeley, Deep, Huston, Grass Valley, Little Bear and Hook and Holcomb creeks and Devil and Waterman canyons, San Bernardino County.	October
B. L. Crise	5,000	Pauma Creek, San Diego County	October
Ed. Fletcher	7,500	San Luis Rey River, San Diego County	October
W. C. Davidson	5,000	Garcia River and Saunders Creek, Mendocino County.	October
Chas. Wright	40,000	Cold Creek, Siskiyou County	October
Otas E. Pile	7,500	Butte Creek and Oris Lake, Siskiyou County	October
C. M. Parker	9,000	Back Fence, Kangaroo, Bull and Secret lakes, Siskiyou County.	October
Fred. Sullaway	30,000	Wagon Creek, Siskiyou County	October
Fish and Game Commission.	35,000	Big Spring Creek at Rupps Lake, Siskiyou County.	October
Fish and Game Commission.	20,000	Headwaters Sacramento River, Siskiyou County.	October
Fish and Game Commission.	43,000	Sacramento River at Delta, Shasta County	October
	10,000	Held in hatchery ponds, Sisson.	
Total	1,293,500		

SISSON HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF EASTERN BROOK TROUT.

Applicant.	Number.	Waters stocked.	Month of delivery.
J. M. Little	6,000	Rich Gulch and Rush Creek, Plumas County	May
H. C. Chamberlain and associates.	18,000	Homer Lake, Long Valley reservoir and Wolf Creek, Plumas County.	May
W. C. Robinson	18,000	Bear, Buck, Mill, Big, Clear, Rock, Silver and Grizzly creeks, Plumas County.	May
G. C. Longhurst	6,000	Poplar and Miller creeks, Plumas County	May
M. A. Bernheim	12,000	Eureka, Grass, Jamison and Rock lakes and Jamison Creek, Plumas County.	May
Portola Improvement Association.	9,000	Willow, Humbug and Grizzly creeks, Plumas County.	May
Smith & Weil	6,000	Mill Creek and Three Lakes, Plumas County	May
Taylorsville Gun Club	12,000	Lights, Cooks, Indian and Grizzly creeks, Plumas County.	May
Quincy Gun Club	12,000	Spanish, Rock, Mill, Clear, Greenhorn and Taylor creeks and Middle Fork Feather River, Plumas County.	May
A. Machomieh	6,000	Feather River, Sulphur and Willow creeks, Plumas County.	May
Chas. Geisendorfer	6,000	Catfish Creek, Placer County	June
W. J. McCleary	9,000	Combs Ravine and Bunch Canyon, Placer County.	June
Samuel Mitchell	6,000	Bear River and Canyon Creek, Placer County	June
Boca Mill Company	10,000	Little Truckee River, Nevada County	June
F. M. Rutherford	20,000	Truckee River, Schaffer and Alder creeks, Nevada County.	June
W. F. Whittier	12,000	Warmcastle Canyon, Squaw and Snell creeks, Siskiyou County.	June
North Fork Game Protective Association.	12,000	Gass Canyon Creek and Dry Creek, Placer County.	June
J. F. Geisendorfer	6,000	Headwaters of Wooley Creek, Placer County	June
J. B. Knapp	18,000	Canyon Creek and North Fork American River, Placer County.	June
H. M. Freeman	24,000	South Yuba River, Placer County	June
A. S. Nichols	12,000	Feather River, Sierra County	June
Lake Tahoe Railway and Transportation Co.	24,000	Blackwood Creek and Truckee River, Placer County.	June
Grover Russi	18,000	Prosser Creek, Nevada County	June
North Fork Game Protective Association.	18,000	North and Middle Forks American River, Owl and Grass Canyon creeks, Placer County.	June
Nevada City Hunting and Fishing Club.	39,000	Deer, Rock, Little Deer creeks and Woods Ravine, Nevada County.	June
C. F. Hensel	12,000	North Fork Elder Creek, Tehama County	June
E. Meybem	12,000	Butte Creek, Butte County	June
Ocean Shore Railroad Company.	6,000	Pedro, Tunitas, Frenchman, Higgins, Lobitos and Purissima creeks, San Mateo County.	June
Chas. H. Glenn	18,000	Mill Creek and South, Middle and North Forks Stony Creek, Colusa County.	June
Phil T. Laugenour	18,000	Cache and Allen creeks, Yolo County	June
H. H. Zimmerman	12,000	Mill Creek, Tehama County	June
Mrs. Geo. Farley, Jr.	18,000	Kelsey Creek, Lake County	June
B. G. Diehman	12,000	Clear Creek, Napa County	June
Sierra and San Francisco Power Company.	18,000	Indian and Clarks creeks and Middle Fork Stanislaus River, Tuolumne County.	July
Geo. F. Conlin	12,000	South Fork Stanislaus River, Tuolumne County.	July
G. W. Vestal	9,000	South Fork Cottonwood Creek, Tehama County.	July
W. M. McCleary	9,000	Shirttail Canyon, Placer County	July
W. J. Hall	6,000	Bear River, Placer County	July
H. Wilkie	12,000	Prosser Creek, Nevada County	July
Miss Katherine Chandler	12,000	Five Lakes, Bear and Squaw creeks, Placer County.	July

SISSON HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF EASTERN BROOK TROUT—*Continued.*

Applicant.	Number.	Waters stocked.	Month of delivery.
Glen Alpine Springs Company.	9,000	Susie Lake, El Dorado County	July
Al Tahoe Company	6,000	Trout and Cold creeks, El Dorado County	July
Mrs. G. W. Kenney	6,000	Independence Lake, Nevada County	July
Lawrence & Comstock	18,000	Small lakes and streams near Tallac, El Dorado County.	July
Tahoe Vista Investment Company.	9,000	Griff Creek, Placer County	July
H. E. Cagwin	9,000	Upper and Lower Echo lakes, El Dorado County.	July
Santa Clara County Fish and Game Protective Association.	36,000	Distributed in streams of Santa Clara County	July
Frank P. Cady	7,500	Susan River, Silver and Caribou lakes, Lassen County.	July
F. D. Hall	5,000	Willow Creek Lassen County	July
Wm. E. Vincent	2,500	Secret Creek, Lassen County	July
Chas. W. Williams	2,500	Parker Creek, Modoc County	July
Geo. D. Campbell	2,500	East Creek, Modoc County	July
L. H. Sisson	2,500	South Fork Mill Creek, Modoc County	July
E. E. Archer	5,000	Shealds Creek, Modoc County	July
I. Lauer	2,500	Pine Creek, Modoc County	July
Sisson Promotion Association.	15,000	Sullaway, Big Spring creeks and North Fork Sacramento River, Siskiyou County.	July
Geo. Neale	6,000	Battle Creek, Tehama County	July
W. P. Yaney	18,000	Longley, Horton and Birch creeks and Middle and South Forks Bishop creek, Inyo County.	July
A. L. Stewart	9,000	Wyman and Crooked creeks, Inyo County	July
Hall & McAfee	30,000	Baker, Big Pine, Little Pine, Birch, Tinnemaha creeks, Big Pine Lakes and Red Mountain Lakes, Inyo County.	July
Harry Shaw	12,000	Dexter Creek, Inyo County	July
R. G. Buchanan	3,000	Walker River, Mono County	August
J. S. Cain	6,000	Walker River, Mono County	August
North Fork Association	9,000	North Fork American River, Placer County	August
A. G. McFarland	6,000	South Fork Yuba River, Placer County	August
Webber Lake Club	6,000	Tributary of Webber Lake, Nevada County	August
J. E. Powell	6,000	Walker River and Lost Canyon, Mono County	August
C. W. Rickey	6,000	Walker River and Big Slough, Mono County	August
G. F. Zentgraff	6,000	Pilot and Bear creeks, El Dorado County	August
Jas. Bryson	7,500	Echo and Adrian lakes and American River, El Dorado County.	August
Grass Valley Sportsmen's Club.	20,000	Clipper, Wolf, Rattlesnake, Dry, Squirrel, Nigger and Slate creeks, Nevada County.	August
A. D. Ferguson	30,000	Six unnamed lakes in High Sierras of Fresno County.	August
Deer Creek Fish and Game Protective Association.	5,000	North and South Deer creeks, Tulare County	August
W. A. Sperry	5,000	Grizzly Creek and Clover Valley creek, Plumas County.	August
Yosemite Valley Railroad Company.	10,000	Merced River, Mariposa County	September
Major Wm. W. Forsyth	10,000	Merced River, Mariposa County	September
W. C. Davidson	5,000	Garcia River and Saunders Creek, Mendocino County.	October
Chas. Wright	10,000	Cold Creek, Siskiyou County	October
	17,500	Held in hatchery ponds, Sisson.	
Total	906,000		

SISSON HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF RAINBOW TROUT.

Applicant.	Number.	Waters stocked.	Month of delivery.
J. McClung	12,000	Berry Creek, Plumas County	May
E. E. Gerry	30,000	North Fork Feather River, Plumas County	May
R. Belden	6,000	Indian and Yellow creeks, Plumas County	May
J. M. Little	6,000	Rich Gulch and Rush Creek, Plumas County	May
J. C. Donnelly	3,000	Grizzly Creek, Plumas County	May
H. C. Chamberlain and associates.	24,000	Homer Lake, Long Valley reservoir and Wolf Creek, Plumas County.	May
W. C. Robinson and others.	51,000	Bear, Birch, Mill, Big, Clear, Rock, Silver and Grizzly creeks, Plumas County.	May
G. C. Longhurst	6,000	Poplar and Miller creeks, Plumas County	May
M. H. Bernheim	12,000	Eureka, Grass, Jamison and Rock lakes and Jamison Creek, Plumas County.	May
Portola Improvement Association.	12,000	Willow, Humbug and Grizzly creeks, Plumas County.	May
R. Van der Naillen	9,000	Yellow and Butte creeks, Plumas County	May
Smith & Weil	18,000	Mill Creek and Three Lakes, Plumas County	May
Taylorsville Gun Club	24,000	Lights, Cooks, Indian and Grizzly creeks, Plumas County.	May
G. H. Goodhue	30,000	Indian Creek, Plumas County	May
Quincy Gun Club	54,000	Spanish, Rush, Mill, Clear, Greenhorn and Taylor creeks, and Middle Fork Feather River, Plumas County.	May
T. A. Church	12,000	Long Valley Creek, Plumas County	May
C. N. Johnson	12,000	Feather River and Smith Creek, Plumas County.	May
A. Machomich	18,000	Feather River, Sulphur and Willow creeks, Plumas County.	May
Wm. Galleppi estate	12,000	Last Chance Valley creeks, Plumas County	May
Chas. Geisendorfer	6,000	Catfish Creek, Placer County	June
W. J. McCleary	6,000	Bunch Canyon and Combs Ravine, Placer County.	June
Samuel Mitchell	9,000	Bear River and Canyon Creek, Placer County	June
Boca Mill Company	68,500	Little Truckee River, Nevada County	June
F. M. Rutherford	10,000	Truckee River, Schaffer and Alder creeks, Nevada County.	June
Sierra Nevada Wood and Lumber Company.	40,000	Prosser Creek, Nevada County	June
S. McKay	25,000	Donner Creek, Nevada County	June
G. F. Kelly	35,000	Truckee River and tributaries, Nevada County	June
W. F. Whittier	24,000	Warmcastle Canyon, Squaw Creek and Snell Creek, Siskiyou County.	June
McCloud River Railroad	60,000	McCloud River, Siskiyou County	June
W. I. Bray	30,000	Antelope Creek, Siskiyou County	June
Siskiyou County Electric Light and Power Company.	30,000	Fall Creek, Siskiyou County	June
Z. Abrams	18,000	Abrams Lake, Siskiyou County	June
Geo. Dennis	60,000	Big Springs, Siskiyou County	June
H. R. Hanley	18,000	Squaw Creek, Shasta County	June
North Fork Game Protective Association.	12,000	Grass Canyon and Dry creeks, Placer County	June
Clark & Branson	30,000	French, Payne's, Etna and Patterson creeks Siskiyou County.	June
J. F. Geisendorfer	6,000	Headwaters Wooley Creek, Placer County	June
Dr. W. M. Tryon	6,000	Green Valley Creek, Placer County	June
J. B. Knapp	6,000	Canyon Creek and North Fork American River, Placer County.	June
H. M. Freeman	42,000	South Yuba River, Placer County	June
A. S. Nichols	24,000	Feather River, Sierra County	June
Lake Tahoe Railway and Transportation Co.	48,000	Blackwood Creek and Truckee River, Placer County.	June
Harmon Bell	36,000	Sweetbriar Creek, Shasta County	June
Jerry Buckley	30,000	Battle Creek, Shasta County	June
Lee Richardson	18,000	Mud Creek, Butte County	June
Nevada City Hunting and Fishing Club.	60,000	Deer, Rock, Little Deer and Woods ravine creeks, Nevada County.	June

SISSON HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF RAINBOW TROUT—*Continued.*

Applicant.	Number.	Waters stocked.	Month of delivery.
F. G. Brown	24,000	Oregon Creek, Sierra County	June
Meek Mercantile Company.	36,000	Oregon Creek, Yuba County	June
L. Y. Coggins	21,000	Dobkins Lake and North Fork Eddy Creek, Siskiyou County.	June
E. C. Lloyd	36,000	Parks Creek, Siskiyou County	June
H. H. Hudson	30,000	Little Shasta River, Siskiyou County	June
California Fish and Game Commission.	300,000	Klamath River, Siskiyou County	June
Kennett Athletic Club	15,000	Big Backbone Creek, Shasta County	June
C. L. Watson	30,000	Clear Creek, Shasta County	June
J. H. Bradley	18,000	Antelope Creek, Tehama County	June
E. Meybem	24,000	Butte Creek, Butte County	June
A. C. Musselman	18,000	Little Butte and Mosquito creeks, Butte County.	June
W. J. Whittier	60,000	West branch of North Fork Feather River, Butte County.	June
B. F. Kaufman	36,000	Little West branch North Fork of Feather River, Butte County.	June
P. H. Dunbar	30,000	Big Nimshew and west branch Feather River Butte County.	June
Clay Buchanan	36,000	Little Nimshew, Big Nimshew and Last Chance creeks, Butte County.	June
Elizabeth G. Stevenson	12,000	Butte Creek, Butte County	June
Santa Clara Co. Fish and Game Protective Association.	30,000	Sweijert, Almaden, Guadalupe, Penetentia and Saratoga creeks, Santa Clara County.	June
J. H. Livermore	9,000	Bear Gulch Creek, San Mateo County	June
Ocean Shore Railroad Company.	45,000	Pedro, Tunitas, Frenchman and Higgins, Lobitas, and Purissima creeks, San Mateo County.	June
J. Boshoff	60,000	Peseadero, Butano and Gazos creeks, San Mateo County.	June
J. A. Owen	24,000	South Fork Cottonwood Creek, Tehama County.	June
Chas. H. Glenn	30,000	Mill Creek and South, Middle and North Forks of Stony Creek, Colusa County.	June
Phil. T. Laugenour	42,000	Cache and Allen creeks, Yolo County	June
Bartlett Springs Company.	30,000	Cache, Bartlett, Mill and Twin Valley creeks, Lake County.	June
Alameda County Fish and Game Protective Association.	12,000	Trout Creek, Alameda County	June
Earle Downing	12,000	Stony Brook and Alameda Creek, Alameda County.	June
Earle Downing	12,000	Tributaries of Valpe and Arroyo Valle, Alameda County.	June
Earle Downing	36,000	La Costa, Indian, Alameda, Bear and Apperson creeks, Alameda County.	June
Earle Downing	24,000	San Lorenzo, Bolinas and Palomar creeks, Alameda County.	June
H. H. Zimmerman	12,000	Mill Creek, Tehama County	July
Fred Werner	18,000	Sutter Creek, Amador County	July
Geo. F. Zentgraff	12,000	South Fork American River, El Dorado County.	July
M. A. Miller	12,000	South Fork American River, El Dorado County.	July
W. R. Stearns	15,000	Sonoma Creek, Sonoma County	July
City of Vallejo	30,000	Lake No. 2 and in creek between Dam No. 1 and Dam No. 2, Solano County.	July
Mrs. Geo. Farley, Jr.	6,000	Kelsey Creek, Lake County	July
John P. Orr	9,000	Soscol Creek, Napa County	July
Joshua Spires	24,000	Marlo, Spiguet and Big Canyon creeks, Lake County.	July
Wm. West and D. S. Keyser.	72,000	Milliken Creek, Napa County	July

SISSON HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF RAINBOW TROUT—*Continued.*

Applicant.	Number.	Waters stocked.	Month of delivery.
B. G. Dichman	9,000	Clear Creek, Napa County	July
Sierra and San Francisco Power Company.	42,000	Indian and Clarks creeks and Middle Fork Stanisalus River, Tuolumne County.	July
Geo. F. Conlin	36,000	South Fork Stanislaus River, Tuolumne County.	July
R. B. Shaw and H. M. De Ferrari.	24,000	South and Middle Forks Tuolumne River, Tuolumne County.	July
J. O. Bigelow	24,000	Basin Creek, Tuolumne County	July
D. E. Roberts	36,000	North Fork Stanislaus River, Beaver, San Antone and O'Neal creeks, Calaveras County.	July
F. L. Dimock	36,000	Sacramento River, Shasta County	July
G. W. Vestal	9,000	South Fork Cottonwood Creek, Tehama County.	July
S. V. Baron	24,000	Mill Creek, Tehama County	July
E. W. Elfendahl	30,000	Slate Creek, Shasta County	July
Dr. Wm. Tryon	6,000	Green Valley Creek, Placer County	July
W. J. Hall	12,000	Bear River, Placer County	July
W. C. Murdoch	21,000	Tributary of Webber Lake, Sierra County	July
Miss Katherine Chandler	12,000	Five Lakes, Bear and Squaw creeks, Placer County.	July
Glen Alpine Springs Company.	15,000	Susie Lake, El Dorado County	July
Al Tahoe Company	12,000	Trout and Cole creeks, El Dorado County	July
Mrs. G. W. Kenney	18,000	Independence Lake, Nevada County	July
Lawrence & Comstock	6,000	Small lakes and streams near Tallac, El Dorado County.	July
Tahoe Vista Investment Company.	9,000	Griff Creek, Placer County	July
H. E. Cagwin	12,000	Upper and Lower Echo lakes, El Dorado County.	July
Santa Clara County Fish and Game Protective Association.	114,000	Planted in the streams of Santa Clara County	July
John L. D. Roberts	72,000	The mountain and coast streams of Monterey County.	July
Dan McCloskey	18,000	Dos Picachos, Bird and Los Muertos creeks, San Benito County.	July
H. G. Porter	27,000	North Fork Feather River, Plumas County	July
H. L. Beecroft	6,000	Grizzly Creek, Ice Lake, Plumas County	July
Frank P. Cady	15,000	Susan River and Silver and Caribou lakes, Lassen County.	July
F. D. Hall	5,000	Willow Creek, Lassen County	July
Wm. E. Vincent	7,500	Secret Creek, Lassen County	July
Dr. C. M. Tinsman	15,000	Ash Creek, Modoc County	July
Chas. W. Williams	7,500	Parker Creek, Modoc County	July
Geo. D. Campbell	5,000	East Creek, Modoc County	July
L. H. Sisson	5,000	South Fork Mill Creek, Modoc County	July
Wm. W. Ahl	10,000	Fitzhugh Creek, Modoc County	July
E. E. Auble	10,000	Fitzhugh Creek, Modoc County	July
I. Lauer	7,500	Pine Creek, Modoc County	July
C. W. Williams	25,000	South Fork Pitt River, Modoc County	July
W. L. Leland	7,500	Antelope, Bottle and Willow creeks, Modoc County.	July
S. F. Ballard	10,000	Thomas Creek, Modoc County	July
Ira Hansen	7,500	Parker Creek, Modoc County	July
H. O. Wickes	36,000	Sacramento River, Shasta County	July
A. F. Stoner	24,000	Tejon Creek, Kern County	July
W. A. Wirth	45,000	North Fork Kern River, Kern County	July
Hall & McAfee	21,000	Baker, Big Pine, Little Pine, Birch and Tinnemaha creeks, Big Pine Lake and Red Mountain lakes, Inyo County.	July
Sisson Promotion Association.	75,000	Sullaway and Big Spring creeks, and North Fork Sacramento River, Siskiyou County.	July
Geo. Neale	12,000	Battle Creek, Tehama County	July
W. B. Engle	39,000	Shepherds Creek, Inyo County	July

SISSON HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF RAINBOW TROUT—*Continued.*

Applicant.	Number.	Waters stocked.	Month of delivery.
Mrs. M. A. Bruley	18,000	Sacramento River, Shasta County	August
A. Davies	9,000	Little Truckee River, Nevada County	August
R. G. Buchanan	6,000	Walker River, Mono County	August
J. S. Cain	12,000	Walker River, Mono County	August
North Fork Association	24,000	North Fork American River, Placer County	August
A. G. McFarland	12,000	South Fork Yuba River, Placer County	August
Webber Lake Club	12,000	Tributary Webber Lake, Nevada County	August
J. F. Powell	6,000	Walker River and Lost Canyon, Mono County	August
C. W. Rickey	6,000	Walker River and Big Slough, Mono County	August
Euell Gray	72,000	Silver, Sly, Park and Alder creeks, Ogilvie Canyon and American River, El Dorado County.	August
J. M. Amick	18,000	Mokelumne and Bear rivers and South Fork Cosumnes, Amador County.	August
C. S. Wilson	18,000	Indian, Reddings, Browns, East Weaver and Rush creeks, Trinity County.	August
J. W. Metcalf	60,000	Sacramento River, Shasta County	August
F. O. Branstetter	36,000	Sacramento River, Siskiyou County	August
D. E. Roberts	30,000	Middle Fork Calaveras River, Calaveras County.	August
I. O. Jillson	24,000	Crystal, Willow and Clear creeks and Klines Gulch, Shasta County.	August
California Door Company.	15,000	North and Middle Forks Cosumnes River, Steeley Fork, Middle, McKinney's, Dog Town and Cut creeks, El Dorado County.	August
James Dodds	18,000	El Dorado, Black, Secret and Humbug canyons, Placer County.	August
Geo. E. King	15,000	Woodruth and Rock creeks and North, East and South Forks of North Yuba River, Sierra County.	August
R. Colwell	12,000	Rubicon River and Rock Bound Lake, El Dorado County.	August
Glen Alpine Springs Company.	15,000	Glen Alpine Creek and Grass, Susie and Heather lakes, El Dorado County.	August
Mayo A. Greenlaw	9,000	Echo Lake, El Dorado County	August
W. W. Price	12,000	Witches Cave and Floating Island, Cathedral, Upper and Lower Angora lakes and Glen Alpine Creek, El Dorado County.	August
Grass Valley Sportsmen's Club.	60,000	Clipper, Wolf, Rattlesnake, Dry, Squirrel, Nigger and Slate creeks, Nevada County.	August
Lawrence & Comstock	9,000	Floating Island and Angora lakes, El Dorado County.	August
Bert Berry	9,000	Poro Creek, Tulare County	September
Widgeon Gun Club	42,000	Kaweah River, Tulare County	September
John Fitzpatrick	18,000	San Benito Creek, Fresno County	September
Porterville Fish and Game Protective Association.	72,000	Redwood, Kessing, Belnap, Boulder and McIntyre creeks, Tulare County.	September
Deer Creek Fish and Game Protective Association.	24,000	North and South Deer creeks, Tulare County	September
T. A. Chatten	27,000	Eagle Creek, East Fork Kaweah and Franklin lakes, Tulare County.	September
H. G. McCaughey	24,000	Salmon Creek, Sonoma County	September
C. G. Bolsdorff	27,000	Russian River, Sonoma County	September
W. A. Sperry	18,000	Grizzly Creek and Clover Valley, Plumas County.	September
Con Roman	6,000	Cheda Creek, Marin County	September
W. A. Jinkerson	30,000	North, Middle and South Forks Cosumnes River, El Dorado County.	September
E. A. Pearce	9,000	San Juan Canyon Creek, San Benito County	September
Monterey Fish and Game Protective Association.	30,000	Rocky, Mill, Miller, Garapatas and Cocagahua creeks, Monterey County.	September
S. E. Whitcher	24,000	Arroyo Seco, Monterey County	September
J. H. Hollister	60,000	Upper San Luis, Torro, Marro, San Luisito, Charro, Corral de Piedra, See Canyon, Coon and Welsh creeks, San Luis Obispo County.	September

SISSON HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF RAINBOW TROUT—*Continued.*

Applicant.	Number.	Waters stocked.	Month of delivery.
Dr. C. S. Noble and others.	24,000	Lopez, Arroyo Grande and Tar Spring creeks, San Luis Obispo County.	September
H. J. Abels	15,000	Sisquoc and Manzana rivers and Birabut creek, Santa Barbara County.	September
H. J. Doulton	30,000	Santa Ynez River and tributaries, Santa Barbara County.	September
H. S. Deaderick	9,000	Rincon, Gilis and Bloodo creeks, Santa Barbara County.	September
Jas. Rasmussen and Sim Myers.	96,000	Coyote Creek, Ventura River and North Fork San Antonio Creek, Ventura County.	September
C. E. Carr	24,000	Trinity River, Trinity County	October
Yosemite Valley Railroad	78,000	Merced River, Merced County	October
Major Wm. W. Forsyth	24,000	Merced River, Mariposa County	October
W. M. Avis	21,000	San Dimas, Wolfskill and Palmer canyons and Recreation Run, Los Angeles County.	October
W. J. Sanborn	18,000	Bear and Ice House canyons and San Antonio River, Los Angeles County.	October
E. D. Silent	24,000	Malibu Creek, Los Angeles County	October
Geo. E. Little	12,000	Rio Hondo and San Jose creeks, Los Angeles County.	October
W. G. Kerckhoff	45,000	San Antonio Creek, Los Angeles County	October
Jas. A. Vale	120,000	Lytle, Devoir, Cable, City, Plunge, Bear, Mill, Salfrit, Creeley, Huston, Grass Valley, Little Bear, Hook, Deep, and Holcomb creeks and Devil and Waterman canyons, San Bernardino County.	October
Strong & Dickenson	12,000	Strawberry Creek, Riverside County	October
John Shaver	15,000	South and North Forks San Jacinto River, Riverside County.	October
H. W. O'Melveney	105,000	San Gabriel River, Los Angeles County	October
Will E. Chapin	12,000	Big Tejunga Creek, Los Angeles County	October
Albert Cummings	12,000	Cummings Creek, Kern County	October
Webb Toms	21,000	Santa Ysabel, Cedar, Cottonwood and Boulder creeks, San Diego County.	October
Jas. A. Vale	6,000	Whitewater Creek, San Bernardino County	October
F. A. Forster	15,000	San Juan, Mission, Viejo and San Juan Hot Springs creeks, Orange County.	October
B. L. Crise	18,000	Pauma Creek, San Diego County	October
H. I. Pritchard	12,000	Topango Creek, Los Angeles County	October
W. K. Robinson	24,000	Tobacco, Santiago and Silverado creeks, Orange County.	October
A. Stacy	9,000	Cold Water Canyon, Riverside County	October
E. B. Collier	9,000	Malibu Canyon, Riverside County	October
Ed. Fletcher	9,000	San Luis Rey River, San Diego County	October
W. C. Davidson	18,000	Garcia River and Saunders Creek, Mendocino County.	October
Chas. Wright	50,000	Cold Creek, Siskiyou County	October
Otas E. Pile	18,000	Butte Creek and Oris Lake, Siskiyou County	October
A. D. Shepard	30,000	Soda Creek, Shasta County	October
Forest Service	24,000	Pilgrim Creek, Siskiyou County	October
J. N. Dobkins	12,000	Shasta River, Siskiyou County	October
Fish and Game Commission.	30,000	Big Spring Creek, at Rupps Lake, Siskiyou County.	October
Fish and Game Commission.	75,000	Sacramento River, Siskiyou County	October
W. W. Morgan	24,000	Antelope Creek, Tehama County	October
Fish and Game Commission.	214,670	Klamath River, Siskiyou County	October
Fish and Game Commission.	78,000	Sacramento River, Shasta County	October
L. W. Fouquier	30,000	Shasta River, Siskiyou County	October
	50,000	In Klinks Lake, for Sisson Hatchery.	
	25,000	In ponds at Sisson Hatchery.	
	75,000	In Sisson Lake, for Sisson Hatchery.	
Total	5,950,670		

SISSON HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF STEELHEAD TROUT (*Salmo gairdneri*).

Applicant.	Number.	Waters stocked.	Month of delivery.
North Fork Game Protective Association.	60,000	North and Middle Forks American River, Owl Creek and Gas Canyon Creek, Placer County.	June
Ocean Shore Railroad Company.	102,000	Pedro, Tunitas, Frenchman and Higgins, Lobitas and Purissima creeks, San Mateo County.	June
Joseph B. Fleming	18,000	San Pedro Creek, San Mateo County	June
J. Boshoff	30,000	Pescadero, Butano and Gazos creeks, San Mateo County.	June
Earle Downing	18,000	Mocho Creek, Alameda County	June
Geo. F. Zentgraff	12,000	South Fork American River, El Dorado County.	July
Earle Downing	18,000	San Leandro and Ivy creeks, Alameda County	June
M. A. Miller	12,000	South Fork American River, El Dorado County.	June
W. R. Stearns	9,000	Sonoma Creek, Sonoma County	June
John P. Orr	9,000	Soscol Creek, Napa County	June
B. G. Dichman	9,000	Clear Creek, Napa County	June
Santa Clara County Fish and Game Protective Association.	12,000	Distributed in streams of Santa Clara County	June
Dan McCloskey	18,000	Dos Picachos, Bird Creek and Los Muertos, San Benito County.	June
C. G. Bolsdorff	9,000	Russian River, Sonoma County	September
Fish and Game Commission.	25,000	Big Spring Creek at Rupps Lake, Siskiyou County.	October
Total	361,000		

SISSON HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF LARGE LAKE TROUT (*Salmo m. tahoensis*).

Applicant.	Number.	Waters stocked.	Month of delivery.
Nevada, California and Oregon Railway.	15,000	Goose Lake, Modoc County	July
A. D. Shepard	15,000	Castle Lake, Siskiyou County	September
G. A. Caswell	24,000	Medicine Lake, Siskiyou County	September
Z. Abrams	30,000	Abrams Lake, Siskiyou County	October
Total	84,000		

SISSON HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF BLACK-SPOTTED TROUT (*Salmo m. henshawii*).

Applicant.	Number.	Waters stocked.	Month of delivery.
H. L. Beecroft	6,000	Grizzly Creek and Ice Lake, Plumas County	July
J. N. Durney	15,000	Mt. Eddy Lake, Siskiyou County	July
Perey Lovejoy	15,000	Mt. Eddy Lake, Siskiyou County	July
Euell Gray	120,000	Cody, Right, Dark, Blood, Echo, Succor and Andrian lakes and American River, El Dorado County.	September
A. D. Shepard	60,000	Castle Lake, Siskiyou County	September
Z. Abrams	20,000	Abrams Lake, Siskiyou County	September
Otas E. Pile	7,500	Butte Creek and Oris Lake, Siskiyou County	October
C. M. Parker	9,000	Back Fence, Kangaroo, Bull and Secret lakes, Siskiyou County.	October
Fred Sullaway	30,000	Wagon Creek, Siskiyou County	October
Fish and Game Commission.	20,000	Big Spring Creek at Rupps Lake, Siskiyou County.	October
B. L. Crise	6,000	Pauma Creek, San Diego County	October
	10,000	Held in hatchery ponds, Sisson.	
Total	318,500		

SISSON HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF QUINNAT SALMON.

Date.	Waters stocked.	Number.
February 23	Cold Creek, Siskiyou County	357,700
April 2	Klamath River at Hornbrook, Siskiyou County	350,000
April 4	Sacramento River at Dunsmuir, Siskiyou County	350,000
April 4	Sent to Sacramento to be marked, Sacramento County	50,000
April 18-30	Cold and Sullaway creeks, Siskiyou County	912,665
April 6	Flume Creek, tributary to Sacramento River, Shasta County	350,000
April 8	Sacramento River at Lamoine, Shasta County	350,000
April 9	Sacramento River at Delta, Shasta County	350,000
April 9	Cold and Sullaway creeks, Siskiyou County	603,735
April 11	Sacramento River at Delta, Shasta County	350,000
April 15	Cold Creek, tributary to Sacramento River, Siskiyou County	334,855
April 23	Sacramento River at Delta, Shasta County	350,000
May 1	Cold Creek, tributary to Sacramento River, Siskiyou County	87,900
May 1	Cold Creek, tributary to Sacramento River, Siskiyou County	294,075
May 16	Sisson Lake, Siskiyou County	287,650
May 17	Sisson Lake, Siskiyou County	763,975
	Total	6,142,555

TAHOE HATCHERIES.

Fish Distribution, Season 1912.

DISTRIBUTION OF BLACK-SPOTTED TROUT (*Salmo m. henshawii*).

Date.	Waters stocked.	Number.
July 30	Truckee River, Placer County	66,300
August 4	Ward Creek, Placer County	80,000
August 7	Slim Jim Creek, Placer County	70,000
August 17	Griffin Creek, Placer County	50,000
August 28	Truckee River, Placer County	30,000
August 29	Independence Lake, Sierra County	40,000
September 5	Ward Creek, Placer County	42,000
September 12	Richardson Lake, El Dorado County	35,000
September 13	Summit Lake, Nevada County	20,000
September 13	Lake Stirling, Nevada County	40,000
September 13	Truckee River, Placer County	40,000
September 14	Donner Lake, Nevada County	45,000
September 15	Donner Lake, Nevada County	45,000
September 15	Burton Creek, El Dorado County	10,000
September 18	Rubicon River, El Dorado County	40,000
September 18	Richardson Lake, El Dorado County	30,000
September 18	Webber Lake, Sierra County	60,000
September 19	Webber Lake, Sierra County	30,000
September 19	Donner Lake, Nevada County	15,000
September 22	Blackwood Creek, Placer County	35,000
September 23	Blackwood Creek, Placer County	50,000
September 26	Blackwood Creek, Placer County	60,000
September 27	Ward Creek, Placer County	30,000
October 1	Rock Bound Lakes, El Dorado County	28,500
October 7	Experimental work in Nevada County	1,337
	Total	993,137

TALLAC HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF BLACK-SPOTTED TROUT (*Salmo m. henshawii*).

Date.	Waters stocked.	Number.
June 22	Taylor Creek, El Dorado County	95,000
June 23	Taylor Creek, El Dorado County	40,000
June 25	Tallac Creek, El Dorado County	62,000
June 25	Fallen Leaf Lake, El Dorado County	62,000
June 29	Tallac Creek, El Dorado County	62,000
June 29	Fallen Leaf Lake, El Dorado County	62,000
July 2	Tallac Creek, El Dorado County	126,000
July 3	Powerhouse ditch, El Dorado County	71,000
July 5	Fallen Leaf Lake, El Dorado County	79,000
July 6	Cascade Lake, El Dorado County	62,000
July 9	Powerhouse ditch, El Dorado County	24,000
July 9	Cascade Lake, El Dorado County	62,000
July 11	Tallac Creek, El Dorado County	62,000
July 11	Fallen Leaf Lake, El Dorado County	62,000
July 12	Little Truckee River, El Dorado County	40,000
July 13	Cascade Lake, El Dorado County	62,000
July 13	Taylor Creek, El Dorado County	69,840
July 16	Taylor Creek, El Dorado County	68,000
July 16	Powerhouse ditch, El Dorado County	68,000
July 21	Taylor Creek, El Dorado County	68,011
	Total	1,306,851

TALLAC HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF LARGE LAKE TROUT (*Salmo m. tahoensis*).

Date.		Waters stocked.	Number.
June	29	Fallen Leaf Lake, El Dorado County	14,000
July	11	Fallen Leaf Lake, El Dorado County	28,000
July	12	Little Truckee River, El Dorado County	14,000
July	13	Cascade Lake, El Dorado County	14,000
July	16	Taylor Creek, El Dorado County	20,000
July	22	Meyers Creek, El Dorado County	35,000
July	23	Taylor Creek, El Dorado County	28,000
July	24	Grass Lake, El Dorado County	35,000
July	25	Cascade Lake, El Dorado County	35,000
July	25	Little Truckee and Angora creeks, El Dorado County	35,000
July	26	Cascade Lake, El Dorado County	52,221
		Total	310,221

GLEN ALPINE HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF BLACK-SPOTTED TROUT (*Salmo m. henshawii*).

Date.		Waters stocked.	Number.
July	20	Lily Lake, El Dorado County	60,000
July	21	Grass Lake, El Dorado County	90,000
July	22	Susie Lake, El Dorado County	15,000
July	22	Heather Lake, El Dorado County	45,000
July	22	Gilmore Lake, El Dorado County	45,000
July	23	Lucile Lake, El Dorado County	15,000
July	24	Half Moon Lake, El Dorado County	60,000
July	25	Grass Lake, El Dorado County	30,000
July	25	Susie Lake, El Dorado County	60,000
July	25	Glen Alpine Lake, El Dorado County	25,649
July	23	Lake of the Woods, El Dorado County	30,000
		Total	475,649

TAHOE HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF EASTERN BROOK TROUT (*Salvelinus fontinalis*).

Date.	Applicant.	Number.	Waters stocked.
Sept. 5	R. Colwell	4,500	Rubicon River, El Dorado County.
Sept. 12	Lawrence & Comstock	5,000	Velma and Granite lakes, El Dorado County.
Sept. 13	F. Gowling	1,500	Summit Lake, Nevada County.
Sept. 15	A. Buckman	900	Cold Stream, Nevada County.
Sept. 16	Lake Tahoe Railway and Transportation Company.	2,800	Watson Lake, Placer County.
Sept. 17	Lake Tahoe Railway and Transportation Company.	2,800	Watson Lake, Placer County.
Sept. 18	F. Pomin	1,500	Richardson Lake, El Dorado County.
Sept. 18	R. Colwell	2,800	Rubicon River, El Dorado County.
Sept. 20	Lake Tahoe Railway and Transportation Company.	1,600	Watson Lake, Placer County.
Sept. 22	Lake Tahoe Railway	1,500	Baker Creek, Placer County.
Sept. 30	R. Kopke	1,000	Truckee River, Nevada County.
	Total	25,200	

UKIAH HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF STEELHEAD TROUT.

Date.	Applicant.	Number.	Waters stocked.
June 4	C. N. Cox	10,000	Ore Creek, Mendocino County.
June 4	G. A. Johnson	10,000	Cold Creek, Mendocino County.
June 5	S. J. Holliday	12,000	Ackerman Creek, Mendocino County.
June 6	W. C. White	14,000	Reeves Creek, Mendocino County.
June 7	A. L. Gibson	16,000	Robinson Creek, Mendocino County.
June 7	John L. Orr	10,500	Big River, Mendocino County.
June 8	H. M. Whilley	15,000	Indian Creek, Mendocino County.
June 8	Elliott B. Davis	15,000	Indian Creek, Mendocino County.
June 8	Dr. C. O. Edwards	15,000	Navarro River, Mendocino County.
June 12	C. M. Manon	10,000	Jack Smith Creek, Mendocino County.
June 13	California Western Railway and Navigation Company.	50,000	Noyo River, Mendocino County.
June 19	H. M. Kemp	25,000	Blue Lakes, Lake County.
July 10	California Anglers Association	50,000	Sonoma Creek, Sonoma County.
July 13	California Anglers Association	50,000	Sulphur Creek, Sonoma County.
July 17	California Anglers Association	28,000	Austin Creek, Sonoma County.
July 20	California Anglers Association	75,000	Paper Mill and Lagunitas creeks, Marin County.
July 26	California Anglers Association	27,958	Russian River, Mendocino County.
	Total	433,458	

Total steelhead eggs shipped to Ukiah Hatchery	470,000
Total loss of eggs and fry	36,542
Number planted	433,458

WAWONA HATCHERY.

Fish Distribution, Season 1912.

DISTRIBUTION OF RAINBOW TROUT.

Date.	Applicant.	Number.	Waters stocked.
June 25	Dr. A. H. Byers	8,757	Lewis and Hogue creeks, Madera County.
June 27	Dr. A. H. Byers	23,352	Thompson and Big creeks, Mariposa County.
June 28	B. H. Mace	5,838	Devils Canyon, Mariposa County.
June 29	E. T. Huffman	5,838	Miami Creek, Madera County.
June 29	A. C. Shaw	5,838	Woodward Creek, Madera County.
July 5	B. H. Mace	2,919	Conway Creek, Mariposa County.
July 13	E. T. Huffman	11,676	Miami Creek, Madera County.
July 15	B. Galispe	23,352	Meadow Creek and Stella Lake, Mariposa County.
July 16	F. C. Boyce	8,757	Merced River, Mariposa County.
July 23	J. C. Westfall	2,919	Oliver Creek, Mariposa County.
July 24	J. C. Westfall	5,838	Grizzly and Grouse creeks, Mariposa County.
July 30	United States Government agents	17,514	Ostrander Lake, Mariposa County.
July 30	J. C. Westfall	5,838	Owl Creek and South Fork Chowchilla River, Mariposa County.
July 31	J. C. Westfall	5,838	South Fork Chowchilla River, Mariposa County.
Aug. 1	J. S. Washburn	46,704	South Fork Merced River, Mariposa County.
Aug. 2	E. T. Huffman	5,838	Miami Creek, Madera County.
Aug. 2	A. C. Shaw	5,838	Grove Creek, Madera County.
Aug. 2	F. C. Boyce	23,352	Big Creek, Mariposa County.
	Total	216,006	

WAWONA HATCHERY.

Fish Distribution, Season 1912.

Distribution of Black-spotted Trout (*Salmo m. henshawii*).

Date.	Applicant.	Number.	Waters stocked.
July 5	B. H. Mace	5,203	Conway Creek, Mariposa County.
July 23	J. C. Westfall	5,203	Oliver Creek, Mariposa County.
July 24	J. C. Westfall	10,406	Grizzly and Grouse creeks, Mariposa County.
July 25	United States Government agents	52,030	Grouse and Crescent creeks, Madera County.
July 26	United States Government agents	41,624	Bridal Veil Creek, Mariposa County.
	Total	114,466	

Distribution of Large-mouth Black Bass.

(By Fish Car.)

Applicant.	Number.	Waters stocked.	Month of delivery.
M. H. Stitt	230	Cache Creek, Yolo County	Aug. 28
Chas. Domenghini	120	Emery Reservoir, Calaveras County	Aug. 30
Chester A. Seroggs	100	Laird Mine Hole, Placer County	Sept. 1
A. D. Shaw	75	Lane Lake, San Benito County	Sept. 2
W. P. Kelley	100	Lake Lagloria, Monterey County	Sept. 2
A. H. Fowler	125	Black Lake, San Luis Obispo County	Sept. 3
W. H. Graves	90	Hughes Lake, Los Angeles County	Sept. 4
Niles R. Turner	110	Turners Lake, San Bernardino County	Sept. 4
Los Angeles Park Commission.	800	Hollenbeck Park Lake, Los Angeles County	Sept. 5
Total	1,750		

Following is a summary of the distribution from the different hatcheries for the season of 1912:

Sisson Hatchery.

Trout eggs collected from the ponds and substations and received from other hatcheries:

	Eggs.	Loss.	Shipped to other stations.	Fry shipped and held for breeding.	Total shipped and held for breeding.
Loch Leven trout	1,500,000	206,500		1,293,500	
Eastern brook trout	1,000,000	94,000		906,000	
Rainbow trout	6,994,000	818,330	225,000	5,950,670	
Steelhead trout	416,600	55,600		361,000	
Large lake trout	92,922	8,922		84,000	
Black-spotted trout	370,164	51,664		318,500	8,913,670
Salmon	6,340,000	197,445		6,142,555	6,142,555
					15,056,225

Tahoe Hatcheries.

Black-spotted trout	3,610,622	342,821	492,164	2,775,637	
Large lake trout	542,761	139,618	92,922	310,221	
Eastern brook trout				25,300	3,111,158

Brookdale Hatchery.

Steelhead trout	2,709,300	603,200	1,302,600	803,500	803,500

Price Creek Hatchery.

Steelhead trout	618,000	38,000		580,000	
Salmon	3,240,000	36,340		3,203,660	3,783,660

Ukiah Hatchery.

Steelhead trout	470,000	36,542		433,458	433,458

Wawona Hatchery.

Rainbow trout	225,000	8,994		216,006	
Black-spotted trout	122,000	7,534		114,466	330,472

Sacramento Experimental Station.

Salmon	1,768,000	418,000	450,000	900,000	900,000

Mill Creek Station.

Salmon	9,364,550	94,320	607,000	8,663,230	8,663,230

Black Bass.

Adult black bass caught up and distributed for breeders	1,750

Total.

Trout distributed and held for breeding in State of California during season of 1912	14,172,258
Salmon distributed in State of California during season of 1912	18,909,445
Black bass distributed in State of California during season of 1912	1,750
Total	33,083,453

Fifty thousand grayling eggs received from U. S. Bureau of Fisheries, at Bozeman, Montana.

Ten thousand grayling fry were shipped to Monterey County, but were lost by applicant.

After the eggs were hatched the fry were placed in one of the ponds at Sisson. They have not been counted and the number remaining in the ponds is not known.